Crisis and Continuity:

A Study of Waste Management Policy Making in 20th Century Sydney

Volume 1

Ian John Reeve

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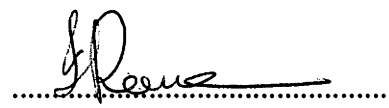
I certify that this thesis is my original work. The work in this thesis has not been submitted as part or all of the requirements of any other degree. Where the thesis draws on the work of other authors, this has been included in the citations. All sources of assistance have been acknowledged.



Preface and Acknowledgments

This study had its origins in some statistical analysis I undertook for the New South Wales Environment Protection Authority (EPA) in 1994 (Black and Reeve, 1994(a) - 1994(e)). The analysis was of the 1994 Benchmark Survey that had been commissioned by the Authority for two purposes — to provide the Authority with information on which to base its community education programs, and to serve as a base-line measurement of environmental knowledge, skills and attitudes among the population of New South Wales, which could be used to gauge the effectiveness of the Authority's programs at various times in the future.

In 1994, there was a growing conviction in the then Education and Community Programs Branch of the EPA that market and social research could play a useful role in the development of community education programs, in the public consultation processes being employed by the Authority, and in the development of policy itself. A problem that loomed fairly large among the Authority's priorities at that time was the disposal of municipal solid waste in the Sydney metropolitan region. The New South Wales Government had publicly committed itself to reducing the amount of municipal solid waste going to landfill by sixty per cent by the year 2000. This courageous commitment was a head-on challenge to the long term trends in the generation and disposal of municipal solid waste. While the recession of the early 1990s had brought the per capita quantity of solid waste requiring disposal down to a level at which the meeting of the year 2000 target appeared feasible, by the mid-1990s this quantity was growing rapidly as the economy recovered.

Consequently, the then Education and Community Programs Branch was of the view that a more detailed and theoretically oriented study of solid waste management in Sydney would be of value, and agreed to contribute to the financial support of such a study.

It is this context that sets the broad scope of the study which is the basis of this thesis — a study of solid waste management in a large city in a modern industrial nation.

A number of people and organisations have given generous assistance to this study.

Firstly, the study would not have been possible without the financial assistance of the Australian Research Council through its Australian Postgraduate Award (Industry) Program. The EPA also provided funding for the study. Alan Black, who would have been a supervisor of the study had not a move to another university intervened, was instrumental in obtaining this funding.

My employer, the then Rural Development Centre of the University of New England provided office space and a computer for the duration of the study and, more importantly, the collegial atmosphere within which aspects of the study could be exposed to a range of disciplinary perspectives. In particular, I am indebted to Judith McNeill and Geoff Kaine for their insights into, respectively, the economics of public infrastructure provision and corporate strategy.

However, the greatest debt of gratitude is owed to my principal supervisor, Elim Papadakis, for his patience and guidance in the many discussions that shaped the content of the study. The assistance at particular points in the study of the other members of the Australian National University supervisory panel, Stephen Dovers, David Adams and Barry Hindess is also gratefully acknowledged, as is that of Geoff Young of the EPA who was the study's industry supervisor.

I am also indebted to Jean Harris for her assistance with word processing and formatting, and particularly for her work with the referencing.

Finally, I was only able to devote the necessary time this study through the support, patience and understanding of my wife and family who surrendered their rightful claims on my time for the duration.

Abstract

The durable partnership between capitalism and technological innovation that has flourished since the Industrial Revolution has forged a tight coupling between prosperity and material and energy flows in the economy. During this time, part of the material flow has been deposited in the natural environment as waste, and part has been recycled back into the economy as an input for economic activity. Economic growth results in growth of the volume of the material throughput of the economy and, if there is not an increase in the proportion recycled, it also results in growing amounts of waste deposited in the environment, either in dispersed forms such as litter, or localised in legal or illegal accumulations on the peripheries of towns and cities. Regardless of whether the reasons for the large amounts of waste produced by modern industrial economies are due to thermodynamic inevitability or the proclivities of capitalist states, governments nevertheless have to devise policy responses to aspects of these material and waste flows that are of public concern.

This study takes the continual emergence of waste problems and policy responses as an assumed feature of modern industrial societies and takes as its central analytical endeavour the explanation of why particular waste problems receive policy attention at particular times, and why particular policy approaches are pursued by governments.

To focus on materials flows and waste streams, however, is to ignore the fact that it is the thinking and behaviour of people that determines what counts for waste and where it is disposed of. Everyone has experience and understanding about household waste that is likely to shape their views about waste issues, their motivation to participate in policy debate and perhaps even the nature of waste management policy itself.

It is argued that municipal solid waste differs in one important respect from many of the other emissions into the environment by industrial societies. Whereas citizens have relatively little experience of what substances like CFCs, carbon dioxide and radio-active waste might look, feel and smell like, everyone, including politicians, knows the sight, feel and smell of household waste. Accordingly, the study devotes considerable effort to a question that appears to have received little attention in the literature: how the nature of lay understandings of waste substances and waste places might change over time and be reflected in the formation of waste management policy. Public

discourse in newspapers and legislatures was chosen as the main arena in which these changes and influences might be sought.

However, it was recognised at the outset of the study, that the explanation of the evolution of waste management policy is unlikely to rest with one factor, however novel it might be. For this reason, the study spans much of the political, economic and social context surrounding waste policy making, with a view to identifying a wide range of explanatory factors which might mediate in the influence of lay understanding of waste on policy.

The theoretical underpinnings of the study reflect this breadth of context. The approach taken was to build upon a number of constructionist accounts of lay understanding of waste, including that of Douglas's 1966 'Purity and Danger', as well as a number of other constructionist, realist institutionalist accounts of environmental policy making. In this respect, the study differs from most other historical accounts of waste management, which are either atheoretical, or positioned within a relatively restricted realist or critical realist theoretical framework.

In its empirical content, the study took as its subject a city and time period that had not previously been studied — Sydney, Australia, in the period 1900 to 1996. In keeping with the focus on public discourse mentioned above, the pages of Sydney's main daily newspaper, the Sydney Morning Herald, and Hansard for the New South Wales Legislative Assembly and Legislative Council were a major source of empirical data for the study. A wide range of annual reports from government departments and authorities, and government and interest group discussion papers were also included. A small number of focus groups and semi-structured in-depth interviews with key waste management actors were also conducted to provide additional insights and validation of the other data sources.

The study found that, broadly viewed, waste management policy-making in Sydney comprised longer periods of relative stability interspersed with shorter periods of change accompanied by various degrees of public controversy. Of particular significance were the 'waste crises' of the late 1960s and the early 1990s, both of which resulted in major legislative changes. Comparison of these two periods provides strong evidence for the thesis that the problems that excite periods of political attention are largely socially constructed.

The study found some evidence to suggest that periods of public disinterest in waste may have occurred when waste accumulations were confined to areas that were regarded as waste land. Public attention was excited when the understanding of either the place of accumulation, or the waste material itself changes. The rise of concern about ocean dumping in the 1930s, and the spectacular participation in the first 'Clean Up the Harbour' in 1989, both appear to be due in part to changes in the symbolic meanings the public attached to these areas. The appearance of plastic bags in the waste stream as a minor but mobile, visible and durable constituent that has become, for many, an objectification of waste problems, is a change in the understanding of waste materials that has also influenced waste policy.

Waste management issues in modern societies are complex and, for these issues to receive attention in public and political discourse, there is a need to reduce these issues into binary codes, metaphors and simple principles. The study found that these were important in building political momentum and consensus on particular issues. However their durability and utility depended upon their being protected from scientific analysis which had the potential to cast doubts on the validity of such apparently self-evident principles as the waste management hierarchy, the environmental desirability of re-usable glass milk bottles, and industry waste reduction targets.

Public fears about toxic substances were also an important influence on waste policy, particularly in the early 1990s. However, it is argued that this is not peculiar to the late 20th century, even though these substances were unknown prior to that. From the miasmas of the late 19th century, to the germs and flies of the early 20th century to the dioxin of the late 20th century, there have always been visible and invisible agents that are feared for their ability to make distant accumulations of waste dangerous to the individual. However, the toxic agents of danger of the late 20th century had greater impact on waste management policy through their association with one of the alternatives to landfill — incineration.

With regard to the mechanisms by which changes in public perceptions of waste might ultimately result in public policy change, the study found some evidence to suggest that aspects of the theory of moral panics are applicable to the 'magnification' of public concerns into something which gains political attention.

However, to account for the evolution of waste management policy in Sydney during the 20th century, it is necessary to supplement these constructionist explanations with a range of realist or structural factors, many of which have already been reported in the environmental policy literature. These include electoral factors, the constraints of political ideology, factors associated with the state agencies charged with implementing policy, environmental movements and individual policy actors.

The study does not, however, seek to claim superior explanatory power for either the constructionist or realist explanations. Rather it has been possible to show how the two are inter-related in the evolution of waste management policy over longer time scales. It appears that structural factors may determine the amount of discursive effort that the political system has to put into obtaining problem closure. Structurally intractable policy problems, such as those Sydney faced in the early 1990s, encourage the emergence of a diversity of binary codes, metaphors and simple principles as policy actors attempt to find framings that will make the problem fit the available solutions. Some of these discursive devices will be casualties to scientific scrutiny, others will survive and gather political momentum and consensus around them. If a particular discursive element allows problem closure, then the resulting institutional innovations may be a reflection of the discursive devices that made them possible. These, and other, institutional changes will furnish the structural constraints on future policy discourse.

The implications of the findings of this study for two theories relevant to long term change in environmental policy — ecological modernisation and the risk society — are also discussed. If respect of the former, it appears that waste management policy in Sydney in the latter part of the 20th century bears most of the hallmarks that have been advanced as characteristic of the condition of ecological modernisation in environmental policy making. The thesis argues, however, that some care needs to be taken with ecological modernist optimism about the shift to anticipatory environmental policy, at least where waste management policy is concerned, as anticipatory waste policy requires movement of the locus of policy intervention in an upstream direction with respect to the materials flow in the economy. This generally increases the uncertainty and contestability of the ultimate environmental effectiveness of the proposals, and increases the possibility of the sort of policy paralysis that occurred in Sydney in the early 1990s.

In respect of risk society theory, the 20th century history of waste management in Sydney provides some support for Beck's enunciation of the theory, but also suggests there are a number of aspects where it unduly simplifies the nature of modern risks and their role in policy evolution. The sorts of risks that lie behind public fears of landfills have certainly come, in the late 20th century, to include a substantial component of industrially produced risks. However, the thesis argues that the history of waste management shows that neither the global nature of risks, nor their invisibility, is necessarily a hallmark of modern industrial production of risk as Beck maintains. There is also a need to acknowledge that the decline in public faith in science is not only due to loss of public faith in science, but the trans-scientific nature of some policy issues. Lastly, the argument in the thesis that public concerns about waste can be brought to political attention in a similar fashion to that which occurs in moral panics, fills out an area of the theory of the risk society where Beck provides very little detail.

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List of Abbreviations

ANZECC	Australia and New Zealand Environment and Conservation Council
EPA	New South Wales Environmental Protection Authority
JSCWM	Joint Select Committee on Waste Management
MWDA	Metropolitan Waste Disposal Authority
MWSDB	Metropolitan Water, Sewerage and Drainage Board
NIME	Not in my electorate
NSW	New South Wales
ORRCA	Organisation for Research and Rescue of Cetaceans in Australia
PET	Polyethylene teraphthalate
PPM	Parks and Playground Movement
SMH	*Sydney Morning Herald*
SPCC	State Pollution Control Commission
SWDP	Solid Waste Disposal Project
TEC	Total Environment Centre
UK	United Kingdom
USA	United States of America
Waste Service	Waste Recycling and Processing Service
WMA	Waste Management Authority
WRAPA	Waste Recycling and Processing Service

Glossary of Waste-Related Terms

Commercial and Industrial waste	In New South Wales, inert, solid, industrial or hazardous wastes generated by businesses and industries (including shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices) excluding building and demolition sites and municipal waste.
Construction and demolition waste	Waste building materials from building and demolition sites.
Dry entombment	Landfill in which the ingress of water is prevented by caps and/or liners of clay and/or synthetic membranes
Hazardous waste	Generally, waste that is thought to be a danger to human health. In New South Wales in the 1990s, solid and liquid hazardous wastes include explosives, compressed gases, flammable solids, flammable liquids, substances liable to spontaneous combustion (excluding organic wastes), substances emitting flammable gases on contact with water, oxidising agents, toxic substances, corrosive substances, pharmaceuticals and poisons, clinical waste, cytotoxic waste, sharps waste, radioactive waste, declared chemical waste, quarantine waste.
Intractable waste	Hazardous waste that is difficult to transform into a form that can be disposed of safely.
Liquid industrial waste	Generally, liquid waste produced by industry. In New South Wales from the 1960s to the 1980s, this term referred to the liquid wastes from industry that were accepted at the Castlereagh Depot, e.g. waste electro-plating liquids. These wastes, especially in the earlier part of the period may have contained some of the substances listed under hazardous waste, above.

Municipal solid waste	Generally, solid waste generated within urban areas and managed by municipal authorities (including private firms contracted by municipal authorities). The waste sources, and therefore waste composition, varies from country to county and town to town, depending upon the waste management arrangements. In New South Wales in the 1990s, municipal solid waste comprised waste from households and residential gardens and waste from street sweeping, litter bins and parks.
Putrescible waste	Generally, organic material that will decompose obnoxiously in the environment. In New South Wales in the 1990s, putrescible waste was defined as food waste, waste conisting of animal matter (including dead animals) and some types of sewage sludge.
Scheduled waste	Generally, waste that is mentioned in a schedule to government regulations or legislation. In New South Wales in the 1990s, scheduled chemical wastes was defined as any waste liquid, sludge or solid containing more than one milligram per kilogram of constituents listed in the *Scheduled Chemical Wastes Chemical Control Order 1994.*
Solid waste	Generally, waste that meets the definition of a solid, viz. has an angle of repose of greater than five degrees, does not contain free liquids or release liquids in tranport and is capable of being moved by a spade at normal temperatures. In New South Wales in the 1990s, solid waste comprised municipal waste as defined above, some types of sewage sludge, manure and nightsoil, waste contaminated with lead from households or institutions, cleaned pesticide containers, drained and crushed oil filters, disposable nappies, incontinence pads and sanitary napkins, food waste, vegetative waste from agriculture or horticulture, non-chemical waste from manufacturing and services such as metal, timber, paper, ceramics, plastics, thermosets and composites.

Waste management, waste policy	Wherever it is clear that the term is being used in relation to Sydney, it can be taken that what is being managed, or the object of policy, largely excludes agricultural or mining wastes, as relatively little of this type of waste is generated in Sydney.

(Definitions for New South Wales are based on: NSW EPA 1999. *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.* NSW EPA, Sydney.)

1 INTRODUCTION

This chapter provides an introduction to the thesis. It commences with an account of the reasoning that leads to the central questions with which the thesis is concerned. This account has two points of departure, one in industrial ecology and one in the social construction of waste. The chapter then proceeds to an outline of the main arguments presented in the thesis, and how these are distributed across the thesis chapters.

1.1 Background to the Study Aims

1.1.1 Material Flows

It is well accepted in the industrial ecology and ecological economics literature (see, for example, Ayres and Ayres, 1996; Martinez-Alier, 1987), that modern Western societies depend for their way of life on a substantial flow of materials and energy. This flow commences with the extraction of natural resources from the environment, proceeds through processing and manufacture to embodiment in infrastructure and consumer products and finally, after varying amounts of time, returns to the environment as materials and energy that has no further use. The flow has many side branches along the way, where materials and energy with no further use are returned to the environment. It

also has loops by which materials considered to be of no further use by some are put to new uses by others, or by which waste energy, such as heat, is put to use.

This thesis is concerned with material flows. While waste management might be taken to apply to the management of waste energy, in this thesis energy flows are not considered and waste management is taken as applying to the management of waste materials.

In addition, the focus is on the flows of materials from society and economy into the environment. These flows have been the subject of public policy ever since the first time a hunter-gatherer attracted the band's opprobrium for defecating at the central campfire. As the magnitude and diversity of material flows has increased over time, so has the amount of policy effort devoted to them, although not necessarily in a simple linear correlation.

There are two direct forms of return of materials to the environment and one indirect one that are the subject of substantial bodies of public policy.

First, there are the forms of sequestration in the environment, where materials stay more or less where they are put, such a piles of unusable rock left at a quarry site, or "dry entombment" landfills. Second, there are the forms of dissipation into the environment where substances are emitted into the atmosphere or water bodies, or spread on the ground and subsequently become part of local, regional and global biogeochemical cycles. Lastly, some substances return to the environment via an indirect route through the metabolism of humans. Ingested substances, either food or accidental contaminants that are swallowed, breathed or absorbed through the skin, are sequestered for varying amounts of time in human bodies before returning to the environment in cemeteries, crematoriums and sewerage works. The errant materials that stray from the materials flow through the engines of the economy into human metabolisms have been responsible for much human suffering, from black lung disease of coal miners to the anaemia and cancers that killed the "Radium Girls" who painted luminous watch faces (Clark, 1997).

Much of environmental policy is concerned with these three ways by which materials return to the environment. Waste management policy aims to avoid or reduce the amount of material going into landfills, or ensure that material in landfills stays where it is put. Air and water pollution policy aims to reduce the deleterious impacts on air and water quality of dissipation of materials into the environment. Public policy dealing with industrial and consumer safety and hazardous materials aims to reduce human health impacts. While the primary focus of this thesis is on waste management policy, it has been necessary to examine some aspects of air and water pollution policy and hazardous waste policy, as the boundaries between the three bodies of public policy are not as distinct as the categorisation of the material flows, above, might suggest.

The quantity and diversity of the materials flow that makes the way of life in modern Western societies possible has increased markedly during the 20th century. According to Gardner and Sampat (1998) there has been in the USA an 18-fold increase in the size of the materials flow. All 92 elements of the periodic table are now present in the materials flow, compared to some 20 elements at the beginning of the 20th century. Over 100,000 new synthetic compounds have been produced since the 1930s . Adriaanse *et al.*, (1997) estimated the size of the materials flow in industrialised nations to range between 45-85 tonnes per person per year. Of this, some 11-25 tonnes per person per year is returned to the environment (Matthews, *et al.*, 2000). Despite some de-materialisation in the economies of the industrialised nations, and decoupling of economic growth from materials flows, these flows and the returns to the environment have continued to grow in the latter part of the 20th century — one half to three quarters of resource inputs to the economies of industrialised nations are discharged to the environment as wastes within 12 months of the time of extraction. (Matthews, *et al.* 2000).

While it might be tempting to see this quantity as merely an outcome of policy failure, and so readily reduced, there is however, a certain thermodynamic inevitability about it. A number of economists have used the laws of thermodynamics to demonstrate that waste products are a necessary and unavoidable joint output of industrial production (e.g. Ayres and Kneese, 1969, Georgescu-Roegen, 1971, Baumgärtner and de Swaan Arons, 2003) . So even if everything that is put in household garbage bins, and in the skips (dumpsters

in USA) in the back lanes of commercial districts, was recycled back into the economy, there would still be substantial amounts of industrial waste products to be dealt with, either from the reprocessing of recycled materials, or from the waste generated from the use of energy needed for the reprocessing. In short, the amount of materials flowing in modern economies, and the amounts of waste materials generated may be in excess of what is possible at maximum feasible thermodynamic efficiencies, but it can never be reduced to zero.

Others have drawn attention to what might be termed the social and political predispositions of modern industrial societies to generate significant streams of waste materials. Arguments for this range from those that emphasise the production side (e.g. Schnaiberg's treadmill theory — Schnaiberg,1980; Schnaiberg and Gould, 1994 and Packard's planned obsolescence, Packard, 1960), to those that emphasise cultural and social factors on the consumption side (e.g. Galbraith, 1958; Ewen, 1976). It is also possible to argue that, regardless of the locus of predisposition to waste generation, it is the structural dependence of the state on capital (Milibrand, 1969; Przeworski and Wallerstein, 1988) that prevents the state from initiating policy to bring about reductions in waste generation that are in the public interest.

Of course, it might be argued that such policy is not needed — that the flows of materials and their return to the environment in a modern market economy will take place harmlessly without the need for any state intervention. The experience of history seems to provide a ready rejoinder to this in the substantial body of public policy that has evolved since the Industrial Revolution to deal with air and water pollution and the health impacts on workers and the public generally.

In summary then, modern industrial societies have been, and will continue to be, dependent upon significant flows of materials through the economy and into the environment. There has been, and will continue to be, significant state intervention in the form of public policy that attempts to prevent or ameliorate the environmental and health impacts of these flows. The reasons for the predisposition of modern industrialised societies to generate waste materials, whether they lie in the laws of thermodynamics, the nature of capitalism, the relationships between capitalism and the state, or modern culture are only of

passing interest in this thesis. Regardless of the reason for the flows of waste materials, governments have had to devise public policy responses to deal with aspects of the flows that have been of public concern. It is the nature of these concerns and the policy responses that forms the central focus of this thesis.

As with all public policy, there are many possible influences on the form that policy takes, and the relative importance of these may change over time. The 20th century has seen enormous changes in the nature of the economy, society and politics, as well as in the nature and size of the waste stream. Changes such as novel substances in the waste stream; new forms of corporate political activity; greater public understanding of, and concern about, environmental issues; the sundering of the alignments between social class and political parties, the changing role of the media in politics, and the emergence of new social movements will have had an effect on the emergence of waste issues and policy responses.

Among the many possible and changing influences on waste policy, there is one aspect which has received relatively little attention and which, I wish to argue, is worthy of closer examination. This brings me to the second of the two points of departure for the reasoning which leads to the questions with which this thesis is concerned.

1.1.2 The Social Construction of Waste

Much of the environmental policy making in the late 20th century has been concerned with the return to the environment of substances from the materials flow which are not recognisable to us in our everyday lives. The appearance, smell or feel of these substances does not provide any clues as to their dangers or safety. A sample in a test tube of substances such as DDT, PCBs, dioxin, carbon dioxide and ozone would not be recognised by most people. We are, as Beck (1986) and Giddens (1990) have argued, dependent upon science and scientists to warn us of the dangers.

However, there have been some remarkable shifts in scientific understanding of the dangers or otherwise of many of the new materials that have been discovered or synthesised in the 20th century. Radium, X-rays and DDT, for

example, were all promoted by scientists in the years after their discovery, only to have serious health dangers emerge that became, and continue in some cases, to be a focus of public and policy controversy (see, for example, Goldschmidt, 1989, Wasserman and Solomon, 1982, Macintyre, 1987). For academics, such issues have provided the grist for the mill of Beckian, postmodernist and other critiques of science. For the person in the street, they feed fears about how to stay healthy in a toxic world — fears which may motivate mobilisation and political activism in environmental policy issues.

In contrast to the unrecognisable substances in the materials flow, the sight, smell and feel what we find in our own household rubbish bins, or collected by our municipal authority from offices, shops and factories in our town, is well known to most people. Almost everyone is familiar with the appearance, smell and feel of food waste from the kitchen, of soiled disposable nappies, of discarded beer cans with fermenting liquid remnants within. Moreover, almost everyone also seems to 'know' when such substances have crossed the boundary from that which is not waste to that which is, and when waste is in the right or wrong place, the latter evoking feelings of disgust and revulsion.

The transitions that substances or objects make, from not waste to waste, or from a positive to a negative valuation, or *vice versa*, can be startlingly abrupt. The parent happily allows their child to eat a carrot, but admonishes the child for playing with something dirty when, ten minutes later, the child wishes to play with the skin peelings from the same carrot. The world record for abrupt transitions has, perhaps, been identified in Thompson's (1979) observations about the clean and fastidious person who:

> *... should quite happily discharge a stream of opaque mucous fluid, liberally studded with darker and more solid fragments, not to mention millions of germs and bacteria which although invisible he knows to be present, into a porous handkerchief and then place the whole soggy parcel, none too carefully folded, in his trouser pocket on top of his small change and cigarette lighter which he will later use to pay for his gin-and-tonics and to light his companion's cigarettes.*
>
> Thompson (1979:3)

However, the boundary between non-waste and waste seen across time and social space is diffuse and mobile, as Thompson (1998) notes. There is great degree of social malleability in this boundary and in the right and wrong places

for the placement of waste in our surroundings. Good housekeeping for my parents in the 1950s was to carefully wrap all kitchen food wastes in many layers of absorbent newspaper before consigning them to the garbage bin. To keep food wastes for several days in a bucket under the kitchen sink as we do now, and then compost them in the backyard, would have been seen as eccentric or slovenly. Across the social space of urban households, for example, empty beer cans accumulate for weeks un-noticed behind the couch in the student household, are promptly put in the right recycling container in the environmentally-correct consumerist household, or have their lids carefully cut away and are transformed into containers for nails and screws in the frugal D.I.Y household. As Thompson's (1979) early explorations in rubbish theory and other more recent endeavours in cultural studies (e.g. Appadurai, 1986) suggest, there is much to be learnt from the study of the trajectories of material objects and the attendant meanings that people place on them in modern societies.

However, the initial focus for this thesis is on the meanings that are placed on materials once they cross the boundary from objects of practical value to become waste (the transient-rubbish boundary in Thompson's categorisation). Furthermore, the emphasis extends beyond rubbish objects in private ownership in or around households or commercial premises (Thompson's interest) to the fate of these objects as they decompose or persist in the environment and become subject to public concern and policy. There are perhaps some novel aspects here to be explored that are not to be found in the world of objects that have practical or symbolic value — *e.g.* aggregation may result in the emergence of new meanings. An aggregation of cars in a car park or an aggregation of fine antique furniture does not produce the additional layers of meaning that attend upon an aggregation of waste products in a landfill, such as fears of disease and vermin. Waste mountains make front page newspaper stories, large collections of antique furniture do not.

The anthropology of purposefully placed waste aggregations in modern societies has been the subject of the seminal work by William Rathje (Rathje and Murphy, 1992). However, in this thesis, I am interested also in the waste materials originating in urban areas and that circulate in the environment, both the obvious waste in public spaces — litter, and the less obvious contaminants

that enter biogeochemical cycles. Consequently, agricultural and mining wastes, which largely originate outside of urban areas, and which certainly do not feature in waste management policy in Sydney, are not considered in this study.

There is much in the changing social world that could be expected to bring about changes in the position of the boundary between non-waste and waste, both across time and social space. There is also much that will impact on the meanings that people attach to waste materials, either in aggregations or circulating in the environment. As O'Brien (1999) argues, this is an area which has been neglected by sociologists, but from which much could be learnt.

However, while in agreement with O'Brien on this point, my interest in this thesis is more with the relationships between the meanings attached to waste and the public policy of waste management. In contrast with the novel substances in the materials flow alluded to at the beginning of this section — the substances which require science to discover whether they are dangerous to human health or the environment — no science is needed to tell the citizen, or the politician, or the bureaucrat whether a large accumulation of household waste on their doorstep is a good idea or not. In other words, everyone has experience and understanding about household waste that is likely to shape their views about waste issues, their motivation to participate in policy debate and perhaps even the nature of waste management policy itself.

Having traced a path from each of two points of departure, one in industrial ecology and one in the social constructivist view of waste, and converged upon the public policy of waste management, it is now possible to state the question that the thesis sets out to answer.

1.2 Research Questions

The question that this thesis sets out to answer is whether the formation and evolution of public policy for the management of solid waste in the city of Sydney in the period 1900-1996 was affected by changes in the understanding

among the general populace of waste substances and waste places and, if so, in what way.

The starting and end points for the time period chosen for the study stem from several considerations. The question itself demands a relatively long period of study, sufficient to encounter changes in waste management policy and how waste is understood by the populace. However, as the starting point is placed at more distant dates in the past, increasing methodological difficulties arise in relation to the ease with which empirical data can be obtained. In addition, the institutions of government, which form the context for waste management policy, become increasingly different from those of the present day.

With these considerations in mind, there are a number of possible starting points that might be chosen some time in the early part of the 20th century. The Sydney Morning Herald, the main daily newspaper in Sydney, began publishing an index to its articles in January 1930. For a topic only reported on occasionally, and with an estimated 500 000 pages of news articles in the duration of the 20th century, 1930 recommends itself as a starting point for practical methodological reasons. The British colonies of Australia formed a federation in 1901, thereby establishing the three levels of government that have formed the context for waste management policy since that time. However, it was not until the Local Government Acts of 1906 and 1919 that local government in New South Wales was established, after a long period of institutional experimentation in the 19th century, in the form it was to take until major reform in 1993.

The thesis commences with some definitional discussion of the nature of the wastes with which it is concerned. Accepting that what is regarded as waste will change across time and social space, I define the type of waste with which the thesis in concerned in terms of physical state and origin (the place at which material crosses the boundary from being of value to being of no or negative value). The thesis is concerned with solid wastes, and with those wastes, handled by municipal authorities or their contractors which originate in and around urban households and commercial and industrial premises.

These definitional matters are followed by a review of the literature relevant to the research question (chapter 2). This finds that the seminal work of Douglas (1966), Thompson's (1979) rubbish theory, the insightful study of Lynch (1990), and William Rathje's Garbage Project (Rathje and Murphy, 1992) provide a useful foundation for a constructionist account of solid waste management. Put simply, what counts as waste and what makes waste something to be feared, has to do with how the human mind places order and classification on its surroundings. Substances that are regarded as waste are frequently ambivalent or anomalous in some way that is a threat to these orderings and classifications.

Insofar as waste is a form of deviant matter, the body of work on moral panics (Cohen, 1972; Thompson, 1998) provides a bridge between the constructionist account of dirt and danger on the one hand and, on the other, the media and political behaviour in modern societies which has to be considered in any analysis of solid waste management policy. The work of Cohen and Thompson and others deals with the question of how particular groups in society can come to be regarded as deviant and a threat to moral order, leading to pressure on legislatures to take action against these groups. Despite the potential offered by the theories advanced in the literature mentioned above, there have been, as far as can be ascertained, no social constructionist studies of the evolution of waste management policy over extended periods of time.

There have, however, been some realist historical studies of waste management (Melosi, 1980; Colten, 1994; Raufer, 1998) and several social histories of dirt and trash (Hoy 1995; Strasser 1999). These are generally atheoretical, although the level of detail and social context in Hoy and Strasser's work invites constructionist theorising.

Theoretically oriented historical studies of waste management *policy and politics* appear to be even fewer, with Gandy's studies of New York, London and Hamburg, interpreted within a neo-Marxist regulationist framework, being the only ones spanning more than a decade or so.

It is concluded from work of these and other scholars that, while a social constructionist approach has much to offer, it would be unwise, given the

findings of the realist accounts, to expect constructionist explanations to provide all of the explanation for the evolution of waste management policy.

While there is a certain paucity of theorising about the evolution of waste management policy, this is not the case for environmental policy making. Within this literature, there is, once again, much that points to the utility of constructionist approaches in understanding waste policy evolution (e.g. Luhmann, 1989; Hajer, 1995; Hannigan, 1995; Williams and Matheny, 1995). These studies and others would suggest that, if the evolution of waste management policy proceeds in the same fashion as other areas of environmental policy, then elements of waste policy discourse, such as dualisms, binary codes and story lines will have an important role in the formation of waste policy.

Given that waste management aims to reduce the health and environmental risks posed by waste accumulations and dissipation in the environment, and that anticipatory policy such as waste minimisation and recycling is a prominent feature of late 20th century waste management, the developing body of work around Beck's (1986, 1992(a)) theory of the risk society and Huber's (1982, 1985, 1989, 1991) theory of ecological modernisation is clearly relevant to a study of the evolution of waste management policy. I do not, however, intend these two areas of theory to monopolise the theoretical foundation for the study, to the exclusion of a constructionist approach which I suggest has considerable potential, yet is relatively under-researched. My intention is, rather, to draw attention to any implications that the study may have for the theories of the risk society and ecological modernisation.

The literature review suggests that there are, in addition to the question posed at the start of this section, a number of supplementary research questions which would allow for a fuller account of the formation and evolution of waste management policy. These questions include:

- whether waste policy making may sometimes be a form of moral panic over deviant matter,
- whether the various dualisms, binary codes and story lines that occur in waste policy discourse have a role in problem closure, policy formation and policy paralysis,

- how realist and constructionist accounts of waste policy formation and evolution might relate to each other, and
- whether Beckian and ecological modernist theories of long term change in environmental policy making are supported by the history of waste management in Sydney.

The following section provides a brief summary of solid waste management in Sydney in the 20th century, before introducing the main arguments of the thesis and tracing their development through the chapters of the thesis.

1.3 Introduction to the Thesis

1.3.1 Waste Management in Sydney

Sydney was founded as a penal colony of Great Britain in 1788 on the south side of Port Jackson. It was some fifty years before some form of municipal governance was established in Sydney. Municipal councils assumed responsibility for garbage disposal, which function generally involved the collection of garbage and its transport to, and dumping on, areas regarded as waste land on the outskirts of settlement. Some garbage was taken a short distance out to sea and dumped, a method favoured during and immediately after the 1900 outbreak of bubonic plague. Incineration was a popular method of disposal during the first half of the 20th century.

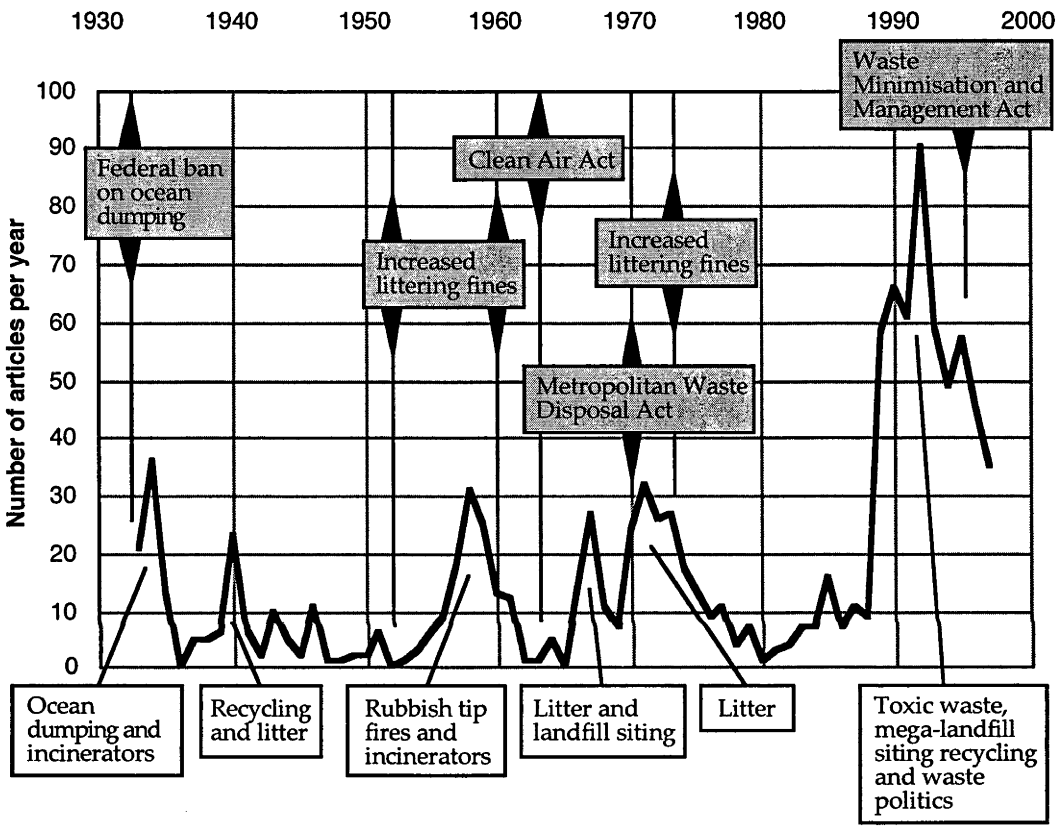
Like many other cities in the Western world, Sydney experienced substantial economic growth and growth in the per capita consumption of material goods in the period following World War II. During the 1950s in Sydney, households had increasing amounts of household waste to dispose of, increasing numbers of households owned a car, and rising standards of living and public health lifted expectations of the quality of suburban life. These three factors put considerable pressure on the waste management infrastructure and institutional arrangements, which until 1970, were largely the province of local government. Dumping of rubbish on roadsides and in bushland, better management of local government tips to reduce public health risks, and the search for additional tip space or ways or reducing the volume to be disposed

of were prominent issues for local government in the 1950s and 1960s. Responses by local government included adoption of landfill techniques as an alternative to open tips and representations to the State Government that resulted in stricter litter laws.

The economic growth and rise in living standards at this time were, of course, due partly to the technological innovations in the chemicals and plastics industries that made possible a vast expansion in the range of consumer goods. These industries also brought with them a new class of industrial wastes. In the late 1960s, problems were encountered with the disposal of hazardous liquid industrial wastes in local government landfills. A study commissioned by the New South Wales Government recommended the centralised management of solid waste and, in 1970, the Waste Disposal Act established the Metropolitan Waste Disposal Authority (MWDA). The Authority was responsible for minimising the health and environmental impacts of the collection, transport and disposal of solid waste. During the 1980s , substantial private sector investment in waste transport and processing occurred, and by the mid 1990s market share in this industry lay with several large corporations. The late 1980s to mid-1990s brought substantial re-organisation of the public sector side of waste management. This re-organisation was in response partly to the difficulties experienced by the MWDA in establishing additional landfills or incinerators to dispose of the growing volumes of solid waste, and partly to a change in focus of waste management from disposal to avoidance, minimisation and recycling. Successive State governments in the 1990s committed themselves to substantial reductions in the amount of waste going to landfill. The MWDA underwent a name change to the Waste Management Authority (WMA) and then later to the Waste Recycling and Processing Service (WRAPS or Waste Service). Some functions were transferred to the NSW Environment Protection Authority (EPA), and the Waste Minimisation and Management Act in 1995 devolved the planning of waste collection, processing and disposal to Regional Waste Boards comprised of groups of municipal councils.

Figure 1.1, below, provides a schematic overview of the period from 1932 (when the main newspaper source used in this study began to be indexed) and 1997 (the end of a period on heightened public debate and policy change).

Figure 1.1 Number of articles per year on waste issues appearing in the Sydney Morning Herald from 1932 to 1997 (including hazardous waste, landfill siting debates, recycling, litter, packaging, and incineration, but excluding industrial action by local government staff involved in waste collection and transport). The boxes below the line describe the main topics of concern during the peaks of media attention. The boxes above the line mark the points in time at which various changes in waste management policy occurred.



1.3.2 The Argument in Brief

The thesis argues that solid waste management policy is indeed influenced by the social construction of meaning in relation to waste substances and places in the environment where waste is deposited intentionally or unintentionally. The influence of the social construction of meaning in relation to waste substances and places of waste accumulation operates through the elevation of particular aspects of waste or waste management to become matters of public concern and policy debate. The thesis proposes that there are three ways by which accumulations of waste in the environment, either purposefully placed or aggregated by the forces of nature, come to excite public concern. Two of these

involve juxtapositions of waste and places of accumulation that may be largely invisible to public notice for long periods of time. However, at particular times, these juxtapositions begin to attract public concern and policy debate for two reasons: either there is a change in the way in which the place of accumulation is understood or used, or there is a change in the way in which the waste material itself is understood.

The thesis identifies two instances when considerable public concern was aroused by a change in the meanings attached to places where waste was accumulating. The first is the ocean dumping controversy in the early 1930s, when the gradual transition of Sydney's ocean beaches from waste places (night soil was buried on Manly's Steyne Beach in the late 19th century), to foci of outdoor recreation and national identity, meant that garbage washed up after ocean dumping could no longer be ignored.

The second relates to the transformation of Sydney Harbour in the Australian bicentennial year of 1988 from a working port to a symbol of nationhood where many of the bicentennial celebrations took place. In 1989, despite previous unsuccessful attempts to organise a major community clean-up, and without any marked increase in the amount of waste and litter accumulating on the Harbour foreshores, 'Clean Up the Harbour' attracted 20,000 volunteers and removed 3,000 tonnes of waste and litter where it had being accumulating in previous years without exciting undue public concern.

Change in the way that waste materials are understood has also resulted in public concerns that impact upon waste management policy. The thesis argues that plastics in the waste stream (including the litter stream) have led to public fears about the contents of landfills and the demonising of plastic bags that has resulted in them receiving media and political attention far in excess of their proportion in the waste stream.

The third way by which accumulations of waste may come to excite public concern is through what I have termed 'agents of danger'. By agents of danger, I mean invisible mechanisms, imagined or real, that convey dangers to a person's cleanliness or health from distant accumulations of waste. Agents of danger, from 19th century miasmas and mephitic air, to 20th century flies,

germs and ecologically circulated organic or radio-active pollutants, are a persistent feature of public concern about waste accumulations. In this thesis, it is argued that the emergence of new agents of danger is a further way by which accumulations of waste may come to excite public concern and policy debate. However, in contrast to the first two ways described above, where public concern was circumscribed in time and space, the emergence of new agents of danger in the late 20th century appears to be more related to maintaining a general distrust of landfills by the public.

Turning to the process by which political attention is attracted by public concerns about waste problems, the thesis argues that this has some of the features of moral panics, particularly with respect to the role of the media in the early stages of emerging waste policy debates in creating the inventory of symbols and meanings which provide the frames for subsequent reporting and political debate. It is concluded that moral panic theory has some utility in explaining the process by which policy debates about waste issues emerge, but, it has to take its place among many other factors that shape these debates.

Among these is the construction of waste management issues and policy options by policy actors, which was an important influence, both upon the time it took for new policies to be introduced by the New South Wales Government, and upon the final form that policy took. The thesis argues that, in 1969 and 1970, the framing of waste problems as being due to 'fragmentation', and consequently requiring a central authority to take responsibility, created a coincidence of interest among the main interest groups at the time, which led to the 1970 Waste Disposal Act and the establishment of the Metropolitan Waste Disposal Authority in a short space of time and with relatively little public controversy. These findings lend strong support for constructionist theories of policy formation which emphasise the importance of discursive devices such as binary codes or dualisms, generative metaphors and story-lines that make discursive closure and policy progress in particular directions possible, while closing off other directions.

Examination of waste management in the period from 1988 to 1996, however, requires a broader explanatory framework beyond social constructionism. The Waste Minimisation and Management Act of 1995 was preceded by some six

years of heightened public concern, vigorous policy debate around what became known as the 'waste crisis' (figure 1.1). It was also a period of general policy paralysis on the part of the State Government.

Both constructionist and realist approaches are essential to understanding this unique period in the history of waste management in New South Wales. From the perspective of policy formation, the central questions are why waste management became such an important public concern during this period, and why it took so long for concrete policy responses in the form of significant legislative reform to occur.

There were a number of reasons that waste issues gained public and media attention, and then became highly politicised. With the establishment of the Metropolitan Waste Disposal Authority in 1971, waste management was gradually rationalised over the ensuing two decades, with waste transfer stations replacing the smaller landfills in the inner parts of Sydney that had been operated by local government. Economies of scale encouraged larger landfills on the outskirts of Sydney. Over the same period, the Authority prevaricated for some fifteen years over building a liquid waste treatment plant, with the consequence that some one million tonnes of liquid industrial waste was disposed of in pits at the 'temporary' Castlereagh Depot in western Sydney. In addition, no progress was made with establishing facilities to treat various hazardous industrial wastes, so that in the late 1980s public concern was raised by reports that some 8,000 tonnes of waste hexachlorobenzene had been accumulated and stored by ICI at its chemical plant in Sydney's inner south. As problems with leaching of pollutants from the Castlereagh Depot occurred, and various committees of inquiry attempted to find a means for disposing of the more hazardous wastes that could not be sent to the Castlereagh Depot, the 'toxic danger' news story framing, with its 'killer waste' and 'toxic time bombs' became well established.

With solid waste volumes increasing during the 1980s, and the rationalisation of waste management mentioned above, the Authority proposed in late 1989 to construct a large landfill (that was often referred to as a 'mega-landfill or 'mega-tip') on the north-western outskirts of Sydney at Londonderry. After several years of community opposition and legal challenges to this and another landfill

proposal, the Authority then decided to place a landfill over the top of the Castlereagh Depot. The prospect of a 'mega-tip' over a 'toxic time bomb' added further to public concerns about waste management.

A further phenomenon which elevated waste into public consciousness during this period was the large scale 'clean-up' campaigns, commencing with 'Clean Up the Harbour' in 1989, described above. Subsequent and expanded clean-up campaigns in the next few years also attracted large numbers of volunteers, at least some of whom, according to the evidence presented in this thesis, saw their litter gathering activity as a means of doing something about wider environmental issues, such as climate change and ozone layer depletion.

With elevated public concern about the environment generally, and waste in particular, and a centralised waste management authority searching for a location for a mega-landfill in Sydney's west, the stage was set for politicisation and policy paralysis. The key factor in the former was the existence of a number of marginal electorates in western Sydney, which was where most of the feasible landfill sites were situated. The availability of landfill sites in this part of Sydney was in part due to the city's history and geography, with the Hawkesbury estuary and Kuring-gai National Park on the northern periphery, and the Royal National Park and various military and water catchment reserves on the southern periphery, making landfill siting infeasible in those areas.

In the early part of the period of policy paralysis, the Government was reluctant to make landfill siting decisions and endanger its hold on power by losing the western Sydney marginal seats in the forthcoming election of May 1991. In this election, the conservative Liberal-National Party Coalition was returned to government with a decreased number of seats, such that it could only form government with the support of four independents, some of whom held pro-environmental views.

While this state of affairs would not have helped the Government in pursuing its legislative program, the thesis argues that there were two other important factors that contributed to the period of policy paralysis. The first of these was the Coalition's commitment to the neo-liberal ideology of 'new environmentalism', which favoured the achievement of environmental goals

using market forces rather than regulation. New environmentalism favoured 'small government' policy initiatives such as removing the public sector monopoly on the disposal of putrescible waste and monetary compensation for those living in the vicinity of the new landfill. These proposals only raised the ire of local government and the general public, who feared that the profit motive would encourage the production of more waste, and who saw landfill siting not as an economic issue, but as a moral issue of whose waste should end up in whose backyard. The Government's inability to find support for such proposals further lengthened the period of policy paralysis.

As the 1995 election approached, the substance of the waste policy platforms of the Labor opposition and the Coalition government converged around the transfer of waste management responsibility from the former Metropolitan Waste Disposal Authority, known at that time as the Waste Service, to regional organisations based on groups of local governments. However, the Coalition was constrained by its ideology to a sparse proposal that gave little indication as to how this was to be achieved, having recourse instead to simple ideological justifications. Regionalisation presented in this way had the appearance of an abrogation of responsibility. The Labor Party, on the other hand, was not constrained by the 'new environmentalism'. It was able to surround its proposal for regionalisation of waste management responsibility with a detailed set of regulatory and administrative arrangements which gave the appearance of comprehensive policy reform commensurate with the publicly perceived seriousness of the waste crisis. This subsequently formed the basis of the Waste Minimisation and Management Act passed in 1995 after Labor won the 1995 election.

The second of the two factors that the thesis argues are important causes of the period of policy paralysis relates to the need for politics to deal with simplifications of policy issues, the political legitimacy of which is readily destroyed by various types of scientific evaluations. Throughout the period of policy paralysis, there were a number of simplified policy principles that were put forward and gathered some support, before losing their legitimacy when evaluated in detail by economists, environmental scientists or industrial chemists. The support that had built during the late 1980s and early 1990s for the idea that the solution to Sydney's waste crisis lay with recycling, was

dissipated by an environmental interest group which showed that the local government areas with the highest levels of recycling were also those generating the highest amount of waste to landfill. The public policy emphasis on recycling (along with waste reduction targets) was criticised by prominent economists for the lack of analysis of costs and benefits.

Environmental interest groups attempted to promote simple principles for reducing the environmental problems (including the creation of solid waste) associated with packaging. These included using paper packaging rather than plastic, and refillable milk and beverage containers rather than cans and plastic containers. These principles could have been translated into policy initiatives such as container deposits or bans on plastic bags, but lost any chance of gaining broad support when various studies (some of which were industry funded) of the energy and environmental costs of the competing packaging alternatives cast doubt on the environmentalists' claims. However, the findings of such studies were never conclusive, being dependent on a range of contestable assumptions and presenting findings in terms of multiple environmental impacts that could not be reduced to a single metric.

Comparison of these events with the relatively rapid discursive closure round the centralisation-fragmentation framing in the late 1960s — a framing that was never subjected to the sort of scientific scrutiny described above — leads to the conclusion that discursive closure and the formation of discourse coalitions to support a particular waste policy principle is a fragile process that can only survive if interest groups refrain from the destructive deployment of scientific scrutiny.

Having expanded the account of 20th century waste management policy in Sydney to accommodate the intricacies of the waste crisis period in the early 1990s, the thesis then places this account within a broader theoretical context. This analysis is conducted on a number of fronts. It considers the relationship between discursive factors (those dealt with in a constructionist analysis) and structural factors (those dealt with in a realist analysis), it raises the possibility of cyclic swings in waste management policy from centralised to regionalised responsibility and back, it discusses the implications of the findings for several areas of theory about long term change in environmental policy and compares

the findings from this study with those from the small number of historical studies of waste management. A brief introduction to these aspects of the thesis now follows.

The thesis argues that constructionist and realist analyses are, at least for the 20th century history of waste management in Sydney, complementary rather than competing. It is suggested that structural factors may determine the amount of discursive effort that the political system has to put into obtaining problem closure, and constrain the universe of possible codes, symbols, metaphors and simplified policy principles that discourse can range across. For example, in the late 1960s, when there was no central waste management authority, and with the interests of the main policy stakeholders favoured by such an authority, it took relatively little effort to obtain discursive closure with a centralisation-fragmentation framing. However, with the structural obduracy of the waste problems in the early 1990s, a great deal of discursive effort was expended on a range of problem frames, before discursive closure took place around the idea of regionalisation of waste management authority.

The relationship between discursive and structural factors can also work in the opposite direction. Policy discourse at one period in time can determine the structural factors which bear upon discourse at a later time. For example, the discursive closure that was obtained with the centralisation-fragmentation framing of the waste problems of the late 1960s, resulted in the Metropolitan Waste Disposal Authority, which agency played a role in establishing the background structural conditions within which policy discourse operated in the early 1990s.

The second aspect of the discussion of the broader theoretical context is the possibility of cyclic change in the responsibility for waste management policy. It is argued that waste management policy in Sydney in the latter part of the 20th century shows some mechanisms by which cyclic alternation between centralised and regionalised authority could take place. When waste management responsibilities and functions are distributed among local governments, unsatisfactory performance can easily be represented as problems of 'fragmentation' of responsibility. Local governments may find difficulty in responding to this due to the inherent conflicts of interest among themselves,

thereby providing a higher level of government with justification for providing a centralised authority. However, one consequence of centralisation of waste management can be centralisation of the waste stream itself. For a single organisation with responsibility for waste transport and disposal, there are attractive economies of scale to be had, including with large landfills. If establishment of landfills becomes politically difficult and a 'waste crisis' ensues, then devolution of responsibility to local government becomes an attractive option, not simply because it relieves the central government of the problem, but also because a number of smaller landfills may be easier to site than one large one. Once waste management responsibilities are distributed among local governments, then the stage is set once more for attributing shortcomings in waste management to 'fragmentation'.

The third aspect of the discussion of the broader theoretical context is the implications of the findings of this study for two theories relevant to long term change in environmental policy — ecological modernisation and the risk society. In respect of the former, it appears that waste management policy in Sydney in the latter part of the 20th century bears most of the hallmarks that have been advanced as characteristic of the condition of ecological modernisation in environmental policy making. The thesis argues, however, that some care needs to be taken with ecological modernist optimism about the shift to anticipatory environmental policy, at least where waste management policy is concerned, as anticipatory waste policy requires movement of the locus of policy intervention in an upstream direction with respect to the materials flow in the economy. This generally increases the uncertainty and contestability of the ultimate environmental effectiveness of the proposals, and increases the possibility of the sort of policy paralysis that occurred in Sydney in the early 1990s. The important point here, which seems to be overlooked in accounts of ecological modernisation, is that the same scientific rationality, needed to develop anticipatory solutions to environmental problems, is also capable of undermining political momentum, built around the simplified policy principles that are necessary for discursive closure and policy progress.

In respect of risk society theory, the 20th century history of waste management in Sydney provides some support for Beck's enunciation of the theory, but also suggests there are a number of aspects where it unduly simplifies the nature of

modern risks and their role in policy evolution. The sorts of risks that lie behind public fears of landfills have certainly come, in the late 20th century, to include a substantial component of industrially produced risks. However, the thesis argues that the history of waste management shows that neither the global nature of risks, nor their invisibility, is necessarily a hallmark of modern industrial production of risk as Beck maintains. The decline of the monopoly of scientific rationality in the risk society is borne out by the events around the closure of the Castlereagh Depot, but there is a need to acknowledge that this is not only due to loss of public faith in science, but the trans-scientific nature of some policy issues. Lastly, the argument in the thesis that public concerns about waste can be brought to political attention in a similar fashion to that which occurs in moral panics, fills out an area of the theory of the risk society where Beck provides very little detail.

The fourth aspect of the discussion of the broader context for the study findings is the comparison with the findings from the small number of historical studies of waste management. The evolution of waste management policy in Sydney during the 20th century is found to be broadly similar to that in the USA and the UK, with the rise of sanitary movements in the late 19th and early 20th century, and the increasing professionalisation and demunicipalisation of waste management in the latter part of the 20th century. However, demunicipalisation appears to have occurred to a lesser extent in Sydney, due to strong public opposition to the transfer of putrescible waste management to the private sector and support for this by a Labor government. The upsurge in waste-to-energy plants in the USA in the 1980s did not occur in Sydney, despite the efforts of USA companies to sell the technology. This was due to the advances made by the Metropolitan Waste Disposal Authority in low cost landfill disposal and effective leachate control, together the high levels of public concern about incineration that had been caused by public debate and public inquiries over a national high temperature incinerator for the disposal of hazardous waste. These differences between Sydney and other large cities show the potential for public fears about landfills and agents of danger, and their impacts on waste management policy to cause substantial departures from the broad trends which are discernible across a number of countries. Lastly, the experience with recycling in Sydney runs counter to Gandy's (1993) view that higher levels of recycling are more likely to occur where there is central waste

management responsibility. Recycling rates in Sydney in the late 1980s were higher than in London or Hamburg, due to the introduction of kerbside recycling by local governments, rather than by the actions of the Metropolitan Waste Disposal Authority which, if anything, had delayed progress with recycling while it experimented unsuccessfully with recycling and buy back centres (also known as bring centres in the United Kingdom).

The discussion of the broader context for the study findings concludes by returning to the concept of the materials flow with which this chapter commenced. It is argued that the policy domains where the sorts of constructionist analysis that has been undertaken in this study will be of most value can be located at specific loci in the materials flow. These are also the domains where Beckian risk politics will be played out and the ecological modernist transition to anticipatory policy will continue to fall short of the theoretical ideal.

1.3.3 Organisation of the thesis

The remaining chapters of the thesis fall into several groups. Following the literature review (chapter 2) and methodology (chapter 3), there are three chapters, (chapters 4, 5 and 6) which provide an account of institutional and policy evolution in waste management in the 20th century. As described in section 1.2, it is this policy evolution for which explanation is sought.

The next five chapters (chapters 7-11) each deal with a single theme within the 20th century history of waste management in Sydney that is of relevance to the development of the arguments in the thesis.

Chapter 12, following the sequence outlined in section 1.3.2, above, develops the main arguments in detail, referring both to the previous chapters and to relevant literature.

The study's conclusions are presented in chapter 13.

The thesis includes a second volume of appendices. Seven of these (Appendices B2 and B4-B9 provides more detailed accounts of the material

presented in chapters 2 and 4-9. Appendix B2 contains a number of reviews of particular bodies of literature, the main findings of which are presented in chapter 2. Appendices B4-B9 supplement the material presented in chapters 4-9. Chapters 4-11 and appendices B4-B9, taken together, present the entirety, from the sources available, of the account of the history of waste management in 20th century Sydney. This gives the reader the opportunity to draw their own conclusions from this material, which would not be possible were I only to present that part of the account that supports the arguments I wish to develop.

A brief description of relationship of the chapters 2-11 to the arguments presented in section 1.3.2 and chapter 12 now follows.

As outlined in section 1.2, above, chapter 2 presents a review of the literature and refines the research questions the thesis endeavours to answer. This review provides the justification for including a consideration of realist explanations for waste policy evolution, rather than confining the study to a constructionist approach.

Chapter 3 describes the methods used in the study. After outlining some distinctions between primary and secondary sources, justification is provided for the reliance of the study on sources such as newspapers, Hansard and government reports which, in some research traditions would be regarded as secondary sources, but which are regarded as primary sources in the constructionist and discourse analytic tradition. The length of the period covered in the study constrains the choice of newspapers to the one newspaper, the *Sydney Morning Herald*, which has been indexed for much of the 20th century. The validatory role of the small number of key informant interviews and three focus groups that were undertaken is also explained.

Chapter 4 describes the origins of the division of waste management responsibility between State and local government. As section 1.3.3 shows, the changes in this division of responsibility is one of the dominant features of solid waste management policy in late 20th century Sydney. The chapter commences with a brief account of the development in the 19th century of the division of responsibility for various urban management functions between the State and local government. These arrangements remained largely unchanged until the 1960s when there were four new pieces of legislation introduced that dealt with environmental problems, the last of which was the Waste Disposal Act of 1970. This chapter traces the origins of the centralisation-fragmentation framing and

the idea of a central authority in the legislation that preceded the Waste Disposal Act, describes the growing liquid waste disposal problems in the late 1960s and shows how the centralisation-fragmentation framing brought about a coalition of interest among those involved in the liquid waste disposal problem. The chapter also shows how the discursive closure around the idea of a central authority resulted in the exclusion of other possible solutions to the problem that did not require a central authority.

Chapter 5 turns to the history of the central authority that was created by the Waste Disposal Act of 1970, the Metropolitan Waste Disposal Authority. Its successful activities (centralisation of the waste stream into large landfills), unsuccessful activities (experimentation with recycling centres) and failures to act (delays in establishment of a liquid industrial waste treatment plant) played an important role in establishing the structural factors that were the context for the period of policy paralysis in the early 1990s.

Chapter 6 is the last of the three chapters that cover the institutional and policy evolution in 20th century Sydney. This chapter deals with the period of policy paralysis from the late 1980s to the passing of the Waste Minimisation and Management Act in 1995. It describes the insubstantial, ineffectual and politically expedient legislation and legislative proposals of the period and explains the political circumstances that contributed to this period of non-policy making. The latter part of the chapter traces the emergence of consensus around the idea of regionalisation of waste management responsibilities and shows how the Liberal-National Party Coalition government was prevented by its political ideology from transforming this idea into substantial legislative reforms commensurate with the perceived scale of the waste crisis. The chapter finishes with an account of the waste reforms introduced by the Labor Party when it gained government in 1995.

Chapter 7 is the first of the five single theme chapters. It provides an account of how areas of Sydney that were regarded as waste places gained new meanings and symbolic identities that resulted in the waste and litter which had been accumulating in these areas becoming the focus of public concerns. The two main areas are the ocean beaches and the Harbour foreshores, and these two instances support the argument in the thesis that changes in the understanding of the places where waste accumulates gives rise to public concern and, in some cases, to changes in waste management policy. The chapter also documents the rich construction of meaning around the foreshore rubbish that was the focus of

the first of Sydney's mass community clean-ups in 1989. This supports the argument later in the thesis that waste in general, and the plastics component in particular, can be seen as a form of deviant matter that can catalyse mild forms of moral panics.

Chapter 7 then considers the industry that is responsible for much of the waste materials that end up in the litter stream — the packaging industry. As this industry has been politically active in both recycling and litter debates, the description of the industry's influence on waste management policy is split between this chapter and the recycling chapter — chapter 9. Chapter 7 describes the continuity in packaging politics from the late 1970s onwards, with governments using the threat of container deposit legislation to extract funding from the packaging industry for anti-littering campaigns . The packaging industry meanwhile promoted the moral dimension of littering as a civic misdemeanour and deflect attention from the alternative framing of litter as a problem of excess packaging production. This contest of meaning over plastic and packaging is dealt with in further detail in Chapters 9 and 11.

Chapter 8 provides a description of what have been termed in this thesis 'agents of danger'. It demonstrates that one of the continuities throughout the 20th century (and earlier) is popular belief in agents that convey harm to the individual from distant accumulations of waste. The nature of the agents has changed, but they remain potent forces in mobilising public resistance to incinerators and landfills. The chapter is divided into two parts. The first traces the history of agents of danger from the bubonic plague outbreak of 1900, through the controversies about incinerators which occurred periodically from the 1930s to the 1970s, to the events in the 1980s which resulted in incinerators of household waste being regarded by the public as little different from high temperature incinerators for the destruction of hazardous wastes. Other events in the 1980s, aided by imaginative media frames, resulted in the popular perception that all municipal solid waste landfills would be contaminated with hazardous waste. The rising public concerns in the 1980s about the dangers of incinerators and landfills contributed community mobilisation against the proposal of Waste Management Authority (formerly the Metropolitan Waste Disposal Authority) to establish mega-landfills in Sydney's western periphery.

The second part of chapter 8 reports the findings from three focus groups that were designed to validate and supplement the account of agents of danger developed from documentary sources and described in the first part of chapter

8. In addition to confirming the inferences drawn from the documentary sources about popular understanding of agents of danger, the focus groups provide strong additional support for the argument presented in chapter 7, that waste in general, and the plastics component in particular, can be seen as a form of deviant matter. The focus group discussion of what might be found at the bottom of a landfill demonstrates how ambiguous materials engender disgust and fear of mutation that contributes to popular dislike of landfills.

Chapter 9 describes a number of aspects of recycling in Sydney from the post-war period onwards. As Strasser (1999) shows, a great deal of recycling that takes place in households and charity shops, or is carried out by poor and disadvantaged social groups, is largely invisible to all but those involved in it. As a consequence of the choice of documentary sources used in the study, this chapter is dominated by the materials and recycling policy issues that have captured media and political attention, *viz.* packaging and container deposit legislation. The chapter outlines the structural and discursive features of recycling as a policy issue, showing that there was considerable continuity from the late 1970s onwards. In the case of the structural features, the case of paper recycling is taken as an example to show how the nature of economic relationships in the paper industry made policy intervention to increase recycling difficult. The slow uptake of recycling was yet another structural factor that lead to the waste crisis of the early 1990s. In the case of discursive factors, the chapter documents the rise of symbolic meaning attached to recycling which led to public and political support for this simple principle which appeared to be the solution to the waste crisis, and to political rejection of economic critiques. The chapter also supplements the description in chapter 7 of the continuity in packaging politics since the late 1970s. Container deposit legislation was advanced by the environmental movement as a means of increasing recycling, but continued to be used by government to extract funding or concessions from the packaging industry. The industry in return continued to resist by funding studies of the behavioural aspects of recycling, thus framing non-recycling behaviours as a form of civic irresponsibility, and studies of the economics of recycling, which tended to be negative because of the ease of estimating industry costs compared to the difficulties of estimating environmental benefits.

Chapter 10 is somewhat briefer than the other single theme chapters. It deals with the role of various environmental groups in the evolution of waste management policy. The chapter does not claim to provide a cohesive account

of the development of the environmental movement in Sydney. Rather, it identifies the points of contact between environmental organisations and the waste issues of interest in this study. These organisations played a number of different roles in waste policy discourse, including contributing to the changing symbolic meanings of Sydney's ocean beaches and broadening the range of policy options being debated in the early 1990s. The Waste Crisis Network was particularly important in this latter respect. The chapter also describes an incident on the Woronora River in 1977 that demonstrates both the role of environmental groups in constructing symbolic links between waste and other environmental issue, and the invisibility of waste in waste places.

Chapter 11 provides the evidence to support the argument that policy progress was delayed during the waste crisis of the early 1990s when various scientific evaluations damaged or destroyed the political legitimacy of simplified policy principles. The chapter commences with four simplified packaging policy principles promoted by the environmental movement — replacing plastic bags with paper, replacing polystyrene cups and trays with paper ones, replacing plastic packaging with bio- or photo-degradable plastic and replacing non-returnable beverage containers with re-usable glass ones. The account shows how various scientific studies (some funded by the packaging industry) exposed contestable assumptions and presented environmental impacts in terms of several non-comparable metrics, such that these simplified principles that were popularly and politically comprehensible failed to gain support and so delayed policy progress.

Chapter 11 then turns to an example of a simplified policy principle — recycling — that had gained considerable popular and political support, to the extent that it was considered by the government as its main policy approach to the waste crisis. This lost its political gloss when the Waste Crisis Network used the improving availability of waste stream data to show that local government areas with the best recycling records were contributing the most waste to landfill. Consequently, the government cast around for new policy directions rather than consolidating policy around recycling. The chapter 11 also provides an account of several other simplified policy principles where there were similar threats to political legitimacy.

As mentioned above, the arguments of the thesis are presented in full in chapter 12, and the conclusions set out in chapter 13.

2 LITERATURE REVIEW

2.1 Introduction

2.1.1 Definition of Waste

Among the main historical studies of waste and waste management, there is a remarkable degree of variation in the extent to which authors concern themselves with defining what is meant by the term 'waste'. Some, such as Gandy (1993), devote relatively little attention to definition. Others, such as Strasser (2000), go to considerable lengths to demonstrate the historical and social flexibility in what is considered as 'waste'. As this thesis is concerned with waste management over a span of almost a century, some attention to the definition of 'waste' is appropriate.

As discussed in appendix B2.1.1, dictionary definitions of 'waste' lead immediately to the conclusion that what counts for waste depends on human perceptions. This is rarely acknowledged in professional or legislative definitions, which generally seek to define waste in terms of such things as its physical composition, its origins, or the dangers it might pose to human health. These definitions do not, however, go uncontested, as is borne out by experience in the European Court of Justice in the last 15 years (appendix B2.1.1). In appendix B2.1.1, it is suggested that, following the judicial reasoning in the European Court of Justice, there is a plausible argument that all materials circulating in the economy after the phases of initial resource extraction, manufacture and consumption, or dissipated into the environment after one or all of these phases, could be considered to be waste. Just as plausibly, however, all these materials might be considered *not* to be waste, but simply materials which pose various degrees of danger or discomfort to humans.

To provide some definitional boundaries for the subject matter of this thesis, the following approach has been taken. Firstly, this thesis is mainly concerned with solid materials. However, because, public policy formation is never neatly partitioned according to the physical state of the substances with which it is concerned, it is necessary to allow the scope of empirical and analytical inquiry in this study to stray into such areas as water pollution, air pollution and the substances, both liquid and solid, that became known in the latter part of the 20th century as hazardous or toxic waste.

Secondly, this thesis is concerned with a particular class of solid waste materials defined by their relation to human activities in industry, commerce, administration and domestic life.

As for any modern nation, the economy of New South Wales depends upon the extraction, transport and processing of materials into finished goods. Given the high proportion of the population located in Sydney (63 per cent in 1999 — Australian Bureau of Statistics, 2003), much of the processing, consumption and disposal takes place in the Sydney metropolitan area. Industrial processes of extraction and manufacturing create material by-products of low value for which there may be neither a buyer nor a profitable use. It is such materials that, at least in the latter half of the 20th century have been termed 'industrial waste'.

The behaviour of people in their daily lives in the residential households of the greater Sydney region also produces solid materials that are perceived by the householder to be of low value and, if allowed to accumulate in or around the household, a source of discomfort or danger, or at least a source of neighbourly disapproval. These solid materials have, in the latter part of the 20th century, generally been termed 'household waste'.

In addition to factories and households, the activities carried out in shops and offices also produce solid materials of an approximately similar nature to that described above for households. These solid materials have been generally termed 'commercial waste'. Obviously, the boundary between commerce and industry is a fairly diffuse one and sometimes the solid waste originating from the two has been termed 'commercial and industrial waste'.

Two forms of commerce, the construction and demolition of buildings, generate solid materials of perceived low value and this material, in the latter part of the 20th century, has been termed 'construction and demolition waste'.

The class of solid materials, then, that are the subject of this thesis are materials that, in the course of the industrial, commercial, administrative and domestic activities carried out in a city, come to be perceived by those who produce them

to have little or no value, or are perceived to be a source of discomfort or danger if they were allowed to accumulate close to the point of their production.

It will be seen from the literature specific to Sydney that is reviewed subsequently in this chapter and its accompanying appendix, that for much of the 20th century in Sydney, the solid waste materials referred to above were popularly known as 'garbage' or 'rubbish', particularly that emanating from households. The terms 'solid waste' and 'municipal solid waste' gradually spread from professional and policy discourse to popular discourse in the 1960s and 1970s. By the 1980s and 1990s, quite extensive categorisations of solid and liquid waste materials were in use in professional and policy discourse. The glossary at the front of this thesis provides definitions for the types of waste referred to in the body of the thesis and its appendices.

2.1.2 Definition of Waste Management

As discussed in appendix B2.1.2, the semantic uncertainties associated with the term 'waste' carry over into the meaning of 'waste management'. Consequently, waste management can potentially refer to the organisation, regulation, administration or control of most materials circulating in the economy or being dissipated or sequestered in the environment, as well as to the same actions applied to energy or to human effort. In this thesis, 'waste management' refers to the organisation, regulation, administration or control of the type of wastes defined in the previous section to be the subject of the thesis. These are the solid materials which come to have little value in the course of human activities in public spaces, factories, offices, shops and households, and for which accumulation at the point of production is regarded as unacceptable. Waste management, then, includes the collective organised behaviours of societies directed at the accumulation of solid materials of little or no value to the owner that are regarded as undesirable, or materials that might accumulate in this way, either by preventing the production of the materials in the first place, or by removing and treating them in various ways before reusing them in the economy or dissipating or sequestering them in the environment in ways that are acceptable.

'Waste management' in this thesis generally refers to the actions of higher levels of social and economic organisation, such as local governments, the legislatures of the New South Wales State Government, State Government agencies, public interest groups and private sector firms. The term 'waste management policy' refers to the actions of governments relating to waste management.

2.1.3 The Literature Review

The literature on solid waste can be broadly divided into that within the engineering and biophysical sciences and that within the socio-economic disciplines. Even by itself, the literature within the socio-economic disciplines that is relevant to the understanding of solid waste management is of considerable extent. Consequently, in embarking on a review of this literature, it is necessary at the very outset to set some guidelines and boundaries that might be justified by the nature of the research task set for the study in chapter 1.

Search Strategy

The search strategy used for this literature review proceeded iteratively among the four steps below.

1 Literature on nuclear waste and hazardous waste was excluded from preliminary searches, but when studies on solid waste that appeared highly relevant to the research task were found to draw on other studies in the nuclear and hazardous waste literature, these latter studies were examined for possible relevance to the research task.

2 Available abstracts in the sociological, psychological, anthropological and environmental education literature in the Sociofile, Psychlit and ERIC bibliographic databases were examined to gain an understanding of what aspects of solid waste management in modern industrial cities are dealt with by these discipline, and of the apparent potential of the particular disciplinary approaches for the research task.

3 All available accounts of waste management over relatively long periods were examined in detail.

4 Many of the frequently cited environmental policy texts published in the last decade were examined, with particular attention to any accounts of waste management policy. Where these texts referred to the public policy literature in a context that appeared relevant to the research task, these small parts of the large public policy literature were also examined.

Period Covered in the Literature Review

The literature review was carried out during 1997 and 1998. Consequently, the majority of the literature discussed in this review was published prior to 1999. However, where works of particular relevance to the thesis that were published in the period between 1999 and the submission of the revised thesis in 2005, these may be referred to in the literature review, or elsewhere in the thesis.

Organisation of the Literature Review

The Australian National University places a 100,000 word limit on PhD theses. To permit a reasonably comprehensive treatment of the relevant literature, it has been necessary to restrict this chapter to a discussion of the main findings from the review. The literature is discussed in detail in appendix B2, in which the sequence of discussion mirrors that in this chapter.

2.2 Waste-Related Studies other than Policy Studies

2.2.1 Disciplinary Breadth of the Field

Solid waste management has been the subject of research in the social sciences in a number of disciplinary areas. These include behavioural psychology, social psychology, sociology, education, economics, policy studies, political science, marketing and advertising research, media studies and anthropology. Much of this could be described as a sort of disciplinary nibbling at the edges of solid waste management issues. As these issues have gained more media and

political attention since the 1970s, disciplines such as behavioural psychology, social psychology, education, marketing and communication studies, education and some parts of sociology and anthropology have identified aspects that are amenable to consideration and analysis from their particular disciplinary perspectives (appendix B2.1.1). Perhaps not surprisingly, it is difficult to assemble such a collection into a cohesive theoretical framework that might underpin the study of waste management policy.

2.2.2 Constructionist Accounts of Dirt and Danger

The work of Douglas (1966) and Lynch (1990) and others (appendix B2.2.2), however, appears to provide some of the foundations for a constructionist account of solid waste management. Put simply, what counts as waste and what makes waste something to be feared, has to do with how the human mind places order and classification on its surroundings. Substances that are regarded as waste are frequently ambivalent or anomalous in some way that is a threat to these orderings and classifications. Lynch (1990:25-26, 53-54) also introduced the idea of waste places — 'symbolically debased areas of the city' that signal that social norms and controls are relaxed in their vicinity and so are likely to attract litter or dumping.

2.2.3 Deviance and Moral Panics

Insofar as waste according to Douglas's and Lynch's account is a form of deviant matter, the body of work on moral panics (appendix B2.2.3) provides a bridge between the constructionist account of dirt and danger and media and political behaviour in modern societies which has to be considered in any analysis of solid waste management policy. The work of Cohen (1972), Thompson (1998) and others examines how particular groups in society can come to be regarded as deviant and a threat to moral order, leading to pressure on legislatures to take action against the specific group, or the wider problem of which the specific group is held to be just one example (Cohen's 'not only this' phenomenon). The claim for a wider problem shifts the locus for policy making from the local to the regional or national. Moral panics and the 'not only this' phenomenon could be seen as the selection of politically tractable symbols for problems about which there broad, but more vague, concerns. Indeed Cohen, Thompson and others have suggested that moral panics are more likely to

occur at times when social change is creating ambiguity and stress for existing ways of understanding.

2.2.4 History

Hoy (1995) provided a comprehensive social history of dirt and cleanliness in the USA from colonial times to the present (appendix B2.2.4). Her study, while not having the social constructionist and anthropological approach of Douglas (1966), nevertheless can be regarded as providing an emphasis on Western society that complements Douglas's focus on traditional societies.

The value of Hoy's study is that it shows, at least for the USA, that there can be substantial shifts over time in the focus of both individual and collective cleansing behaviour. The domains that are regarded as in need of cleansing are likely to influence both the nature of the wastes that cleansing generates, and the sites regarded as appropriate for the disposal of these wastes. For example, it was the focus on the household in the 19th century that produced the rags, bones, dust and cinders that comprised 19th century domestic refuse. It was the disinterest in the street as a focus for cleansing concern that allowed this refuse to accumulate there. The sanitary reform movement in the late 19th century, in directing its attention to the public space of cities, created a new component in the urban waste stream, street sweepings, as well as precluding waste disposal on the streets and forcing its removal further afield. Similarly, the preoccupation with personal and household cleanliness in the 1950s allowed public space to become dirtier again, although what constituted the dirt at this time had changed to discarded packaging.

It is likely that movements in the boundaries between domains considered to need their cleanliness maintained and domains where cleanliness could be ignored were similar in Australia, in that Australia also had an upsurge of sanitary reforms in the late 19th century (see, for example, Bashford, 1994), as well as the development of advertising and consumerism (the source of packaging) parallel with that in the USA. However, there is the possibility of other influences on how these boundaries have changed over time in Australia. Shelton (1998:10), following Wright (1980) points out that Australia's colonial history has resulted in a change in the meaning of waste over time from meaning areas of land that had not yet been brought into some form of production for human use to discarded materials of human construction that

currently have no value in the market economy. In addition, the growth of environmentalism in the late 20th century has resulted in the transfer of some areas of land from being regarded as waste to being valued for their lack of evidence of human impact, or their pivotal role in ecosystem functions. Such shifts indicate that the changes in waste management policy over time are unlikely to be explained solely in terms of changes in the technology of waste management.

The second inference that can be drawn from Hoy's study is that lay understandings and representations about dirt and waste carry a number of elements that have proved remarkably resistant to a major change in the scientific understanding of how disease may or may not related to accumulations of waste. The idea of danger from something that is invisible or nearly invisible, pervasive and able to travel from distant filth to endanger the cleanliness of the individual or their immediate surroundings appears to be an enduring one. When, for example, sewer construction in late 19th century Philadelphia resulted in the decrease of cesspools and their associated miasmas, sewer gas or 'mephitic air' became the new threat to health. Medical authorities attributed typhoid, rheumatism, pneumonia, malaria, croup and diphtheria to breathing sewer gas that had escaped from waste pipes into the home (Raufer, 1998:66). The same attribution of disease to sewer gas occurred in New York (Melosi, 1980:60).

Furthermore, the idea of invisible agents of danger did not disappear with the miasmic theory of disease at the end of the 19th century. Despite scientific evidence to the contrary, germs and flies, and to a lesser extent, rats, took on some of these miasmic qualities during much of the 20th century. The germ theory provided an opportunity to distinguish between dirt that was dangerous to health, and dirt that was harmless, even if it was offensive to the senses, but this opportunity was lost as germ theory became a supplement to, rather than a replacement for, the miasmic rationale for public sanitation. While Hoy did not examine the relationships between the pursuit of cleanliness and toxic wastes in the late 20th century, it is obvious that popular representations of toxic waste that have emerged in the last few decades carry the same miasmic qualities of invisibility, pervasiveness, and ability to travel and endanger the individual by increasing the likelihood of developing cancer. Indeed, Brown and Mikkelsen (1990:xxi) note that two recent books on toxic waste open with discussions of plague and argue that toxic chemicals are 'the plague of our time'. There are also similarities between the fear of miasmas and the 19th century fear of cancer

which represented it as 'an alien and living invader that gave little warning before "eating" into people .... People imagined cancers to be living, moving creatures in themselves — uninvited beasts which surreptitiously ganged up on the body' (Patterson, 1987:30-31, cited by Raufer, 1998:163).

The idea of invisible or near-invisible agents of danger has been present for well over 200 years. Tuan (1981:95-96) gives examples from 14th and 16th century Europe in which plague was attributed, not only to local sources of putrefaction, but to the 'drawing up' of noxious vapours in India and the Middle East. As late as 1891, a London physician was attributing the spread of plague around the world to the odours emanating from the mounds of corpses left unburied after natural disasters in China (Tuan, 1981:98).

Lastly, Hoy's study shows that ideas about cleanliness are inextricably linked with ideas about morality. In the early 20th century, the immigrants to the USA were seen as a threat both to middle-class standards of cleanliness and to middle-class morality. Public programs in the immigrant neighbourhood sought to inculcate both domestic hygiene and American values. This link between cleanliness and morality in the period of sanitary reforms in the late 19th century and early 20th century has also been commented on in an Australian context in the work of Bashford (1994:93) — 'Firmly conflating morality and physicality, sanitary reformers held that health and disease were fundamentally determined by individual and environmental moral and social conditions'.

While it may no longer be acceptable for public programs to be based on the assumption that dirt and immorality go hand in hand, the household and personal cleanliness products industry, through its use of the effective social approval advertising format, continues to depict a society where one's social acceptability depends on scrupulous attention to the cleanliness of self and domestic surroundings. This, together with Hoy's observation that cleansing activities may have been part of a reaffirmation of local or national identity or sense of purpose in times of difficulty or ambiguity, suggests that the relationship between the evolution of waste management policy and broader social issues is worthy of investigation.

2.3 Economic and Technical Policy Studies

Cost has always been a significant consideration in the provision of waste management infrastructure. With the development of environmental economics in the second half of the 20th century, economic scholarship has played an important role in the assessment of waste minimisation, recycling and disposal options. A substantial literature exists in this area, a small fraction of which is reviewed in appendix B2.3.

Nevertheless, this review is sufficient to establish several points in support of the direction being proposed in the present study. Firstly, the practicalities and costs of preventing waste dumping means that authorities that raise the costs of disposal are just as likely to encourage illegal disposal as waste reduction or avoidance. Waste policy will always have to be more than pricing policy.

Secondly, the emphasis placed on efficiency by neo-classical economics, and its eschewing of equity and distributional issues, makes it singularly ill equipped to deal with the task of explaining the evolution of waste management policy. The ideal of directing waste to places with the lowest disposal costs collides head-on with the politically significant question of whose waste ends up in whose backyard. What appears to the economist as unhelpful distortions of the market ideal — 'dictation by unwarranted social pressures' or ' the powerful mantras of environmentalists', to use the terms of economists Choe and Fraser (1998) — may well be manifestations of the most important explanatory factors.

Thirdly, the difficulties encountered in technical and economic studies of waste policy in deciding just what counts as waste and what environmental and health effects should be included in analyses introduce a degree of subjectivity into these studies that is further encouragement for a constructionist approach to understanding waste policy.

These three points do not mean, however, that economic considerations have no role in the explanation of waste management policy. Many of the day-to-day decisions made by private firms and public utilities involved in waste management are very much influenced by economic considerations. What is being argued is that these considerations can be regarded as approximate constants across the broad sweep of history that is of interest to the present study (the basic principle used by hierarchy theory in attempting to understand complex systems — see for example, Simon, 1973).

2.4 Historical Policy-Related Studies

There have been a number of studies that have provided accounts of waste management policy over relatively long periods of time. These include Melosi's (1980) study with its main emphasis on USA cities in the period 1880-1920 (appendix B2.4.1), Gandy's (1993, 1994) studies of late 19th and 20th century London, Hamburg and New York (appendix B2.4.2) and Colten's (1994) study of chemical waste disposal in the USA from 1900-1960 (appendix B2.4.3). The work of Melosi and Colten was mainly descriptive, whereas that of Gandy was more concerned with seeking explanation for the trends in waste policy formation he identified, part of which was within a neo-Marxist regulationist framework.

A number of waste management policy studies covering shorter periods were also reviewed. These include Luton's (1996) study of the establishment of a municipal waste incinerator in Spokane, USA (appendix B2.5.1), Ozawa's (1991) study of the attempt to establish a waste incinerator at Brooklyn Navy Yard, New York (B2.5.3), Lake's (1994) and Williams and Matheny's (1995) studies of hazardous waste management policy in the USA (appendix B2.5.5) and Gilpin's (1980) short review of Australian waste management policy in the 1970s (appendix B2.5.5).

In my view, these historical studies provide useful accounts from which the main features of waste policy making can be abstracted. These include:

- the cycles of public attention and inattention to waste matters,
- broad spatial patterns of senescence and rejuvenation within cities, that can result in formerly unproblematic waste areas becoming a focus for political attention,
- the political interest in the degree of centralisation or decentralisation of waste management responsibility within government, and the raft of arguments for one or the other,
- the distribution of waste management responsibilities between municipal, State and Federal governments,

- the influence of other public policy changes, in particular symbolic environmental politics in State or Federal legislatures remote from the locus of application of waste policy,

- the influence on waste policy of environmental discoveries,

- the distribution of waste management functions between the private and public sector,

- the professionalisation of waste management and policy-making, the application of scientific rationality and planning, and the balance between the health and engineering professions

- the role of the established formal environmental groups, public opinion and the media,

- the engagement of local grass-roots organisations in municipal politics,

- the power of particular toxic substances, particularly dioxin, to mobilise community resistance and paralyse the politics of waste facility siting,

- the strategic behaviour of large waste-generating and waste-processing industries, in particular the way in which they have influenced the distribution of financial and environmental risks, and

- the susceptibility of waste processing industries to price instability caused by factors external to the industry.

2.5 Waste Policy and Policy Theory

The accounts of the evolution of waste management policy summarised in appendix B2.4 and B2.5 provided an opportunity for at least some of the respective authors to test existing theories about public policy-making in general and environmental policy-making in particular. The degree of abstraction that has been employed varies considerably, from Gandy's neo-Marxist regulationist explanations, to Ozawa's empirical generalisations about the role of science in environmental policy-making, to Colten's and Melosi's largely atheoretical treatments.

2.5.1 Political Systems Theory

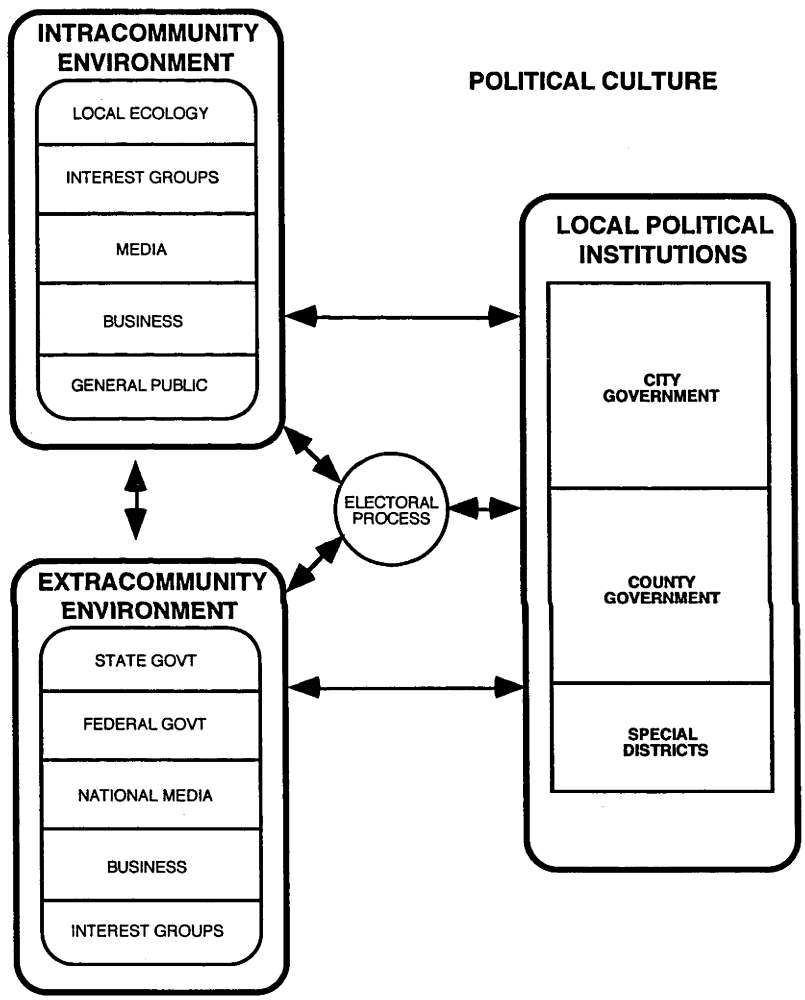
Luton, after describing what he regarded as the advantages and disadvantages of a range of theoretical approaches to understanding public policy-making, chose political systems theory as his preferred conceptual framework for the study of the establishment of the Spokane waste-to-energy plant. Luton claimed that political systems theory had the potential to incorporate insights from other areas of theory, and modified Easton's (1965) model of a political system to produce a general model of a local solid waste policy system, (Luton, 1996:Fig 2.1, p.49) and a model of the Spokane solid waste policy system (Luton, 1996:Fig 2.2, p.51), reproduced in figure 2.1. Luton recognised there were several disadvantages of the political systems approach, including the risk that the depicted relationships between the components of the system could be seen as static, and the problem that the theoretical inclusiveness of the approach could well incorporate the shortcomings in addition to the strengths of other theoretical approaches.

In Luton's assessment of the utility of the political systems approach in his final chapter, it is clear that this approach's strength is that it ensures that the complex interconnectedness of solid waste policy-making is never lost sight of. The multitude of events, decisions and individual actions that lie behind waste management policy-making in Spokane can all be accommodated by his model. However, it is difficult to see how the political systems approach can be more than a diagrammatic check list of the readily identified entities, such as governments and interest groups, and whether or not these entities interact with each other in some way. For example, Luton's account identifies a number of ways in which the views of the general public and local government officials about the balance between state and private sector involvement in waste management had an influence on particular waste management decisions. He also shows how these views can be traced back to their origins in the political cultures brought by immigrants to the American West. However, such specific influences can only be shown in the vaguest of ways in a political system model, such as shown in figure 2.1, where political culture is simply represented as an undifferentiated and all-encompassing influence on the components of the model.

If it is accepted that the primary purpose of theory is to condense and organise knowledge about the world and to explain (Neuman, 1997:37, 48), then this application of political systems theory appears to fare better with the first

purpose than with the second. This is at least partly because its comprehensiveness, inclusiveness and naturalistic components draw attention away from abstract concepts that might have more explanatory or predictive power. There is some suggestion of this in Luton's own conclusions.

Figure 2.1: General model of local solid waste policy system. (After Luton, 1996:Figure 2.2, p.51.)



If we return to the basic political questions asked by public policy theorists and apply them to solid waste policy making, we may conclude that the answer to the question 'Who rules?' is 'No one does.' In this system, no one element has sufficient power to control the system's overall response to a given problem. To the question 'Who governs?' the answer is 'Everyone does.' In this system, everyone is interconnected, so even those who think they are choosing not to participate are, by that decision, affecting the manner in which we govern ourselves and the solutions our governance develops for the problems it faces. To the question 'Who benefits?' one might answer 'Almost everyone, and no one.'

(Luton, 1996:261)

These somewhat glib answers divert attention from the lack of macro- or meso-scale theory that might form the foundation of explanations that go beyond the detailed network of actors and events so ably described in Luton's work. To give just one example, if the abstract concept of risk and uncertainty is introduced, then the question 'Who benefits?' can be reframed in terms of who bears the inevitable risks associated with solid waste management and who manages to insulate themselves from these risks. There are many risks and uncertainties involved in upgrading waste management infrastructure to deal with growing populations and growing per capita generation of waste. Many of these relate to the unpredictability of local decision-making about the location of such things as incinerators, transfer stations, recycling centres and landfills. Local opposition can result in delays and burgeoning costs. Delays can also result in serious environmental damage and health hazards. The volumes of waste generated can change rapidly with unexpected population influxes. The composition of some waste materials, such as packaging, is beyond the control of those managing the waste stream. Novel packaging materials can lead to unexpected hazards in incinerator emissions. New discoveries with environmental monitoring can lead to more stringent emission standards and the need for upgrading waste management infrastructure.

Luton's account suggests that one of the main private sector operators in the waste management system for Spokane, Wheelabrator, who constructed and operated the waste-to-energy incinerator under contract to the Solid Waste Disposal Project (SWDP), was particularly adept in ensuring that it was insulated from many of the risks outlined above. The terms of this contract enabled Wheelabrator to fine SWDP substantial sums of money if there were delays in obtaining permits for construction, or in SWDP supplying waste once the incinerator was ready to receive it (Luton, 1996:25). The 'put or pay' clause in the contract meant that SWDP was legally bound to supply waste in the quantities required by the incinerator, or make financial restitution for any shortfalls (Luton, 1996:28). With the decision by the Supreme Court that incinerator ash should be managed as hazardous waste, the Spokane waste-to-energy incinerator then required additional treatment of its ash before it could be landfilled. The cost of the additional equipment was borne by SWDP under the terms of its contract with Wheelabrator which specified that SWDP should pay for the costs of any pollution control equipment needed as a result of new environmental standards (Luton, 1996:27, 29). In effect, SWDP, rather than Wheelabrator, bore the risks associated with uncertainties in contested local

approval procedures, in forecasting future waste volumes and in future environmental standards. There is little doubt, then, returning to the questions Luton posed, that Wheelabrator benefited considerably through insulating itself from the uncertainties of solid waste management. Exactly why Wheelabrator was able to negotiate such a favourable contract is not explained directly in Luton's account. However, it can be noted that the number of firms in a position to tender for the operation of a large waste-to-energy facility was relatively small, because of the wide range of specialised expertise required. Secondly, with the discovery of the potential for landfills to pollute Spokane's groundwater supply, and the need for alternatives to local landfills, greater levels of expertise were required in developing new waste management infrastructure than was available among the professional staff of local government. This would suggest that structuralist theories of public policy-making may have something to offer in explaining how the costs of uncertainty in waste management are distributed.

Finally, in assessing the utility of Luton's rendering of political systems theory, it can be noted that the theory seems to be largely ahistorical. Apart from Luton's inclusion of Waste's city ecology model which posits cycles of activism and conservatism in local government, there is nothing in the rich tapestry of actors, organisations, governments and the relationships between them to provide a sense of which relationships might be expected to occur at which times in the 'story [that] has no ending'.

2.5.2 Realist/Structuralist Approaches

This contrasts with the clearly historical nature of Gandy's (1993) study. As described in appendix B2.4.2, Gandy suggested that a long period of municipalisation of waste management was followed by a period of demunicipalisation. This he attributed to changes external to local government policy-making, mainly pressures from national governments for cost reductions and pressures for action from the environmental movement and the public. On the question of whether the process of policy-making, as distinct from the content of policy, has changed, Gandy is largely silent. However, the substantive nature of, and rationale for, waste management policy has received close attention in Gandy's work. In providing a context for his study, Gandy suggests that policy proposals and their rationales fall into three groups, each with its own theoretical underpinnings (Gandy, 1993:23-29):

- market-based and technocratic approaches which are underpinned by logical positivism and neo-classical economics and have an emphasis on technological change and correction for market failure,

- behavioural and humanistic approaches which are underpinned by liberal pluralism and humanism and have an emphasis on environmental education and behavioural change, and

- political economy approaches which draw on structuralism and realism and emphasise fundamental changes in the nature of property, the economy and social and political structures.

Gandy concluded that the rationales for the first two policy approaches were incapable of explaining both the evolution of waste management arrangements and the limits to recycling rates.

He suggested that the trends of municipalisation and demunicipalisation could be explained in terms of the periodisation in capitalist states posited in neo-Marxist regulation theory. Although the temporal match between Gandy's periodisation of municipal waste management and the competitive regulation, Fordist and post-Fordist phases posited by regulation theory was certainly less than perfect, it nevertheless serves to signal the possibility that part of the explanation for the nature of waste management policy-making may lie with the interaction of fundamental political, economic and social structures. Lending support to this possibility is the close involvement of local government in waste management and the favour that regulation theory has found in understanding changes in the nature of municipal governance (see, for example, Goodwin, Duncan and Halford, 1993). Colten's account of how the USA chemical industry was able to delay public policy-making to reduce the impact of its waste disposal practices (appendix B2.4.3) is also broadly consistent with Lindblom's (1977, 1981) views about the structural power of business.

Gandy also concluded that his findings demonstrated the utility of a research approach that combined empirical and historical accounts of waste management policy, claiming also that this approach provided a better understanding of the evolution of recycling than did ahistorical theoretical analyses based on positivist and neo-classical economic explanatory

frameworks. A similar argument for policy studies generally was advanced by Dror (1986:5) who maintained that short time spans prevent the recognition of basic patterns over time. The shortcomings of neo-classical economics in normative analysis of policy options in recycling have also been referred to in section 2.3, above.

Gandy argued that because his approach had been rarely used, in comparison to a relatively greater number of policy studies with a positivist and neo-classical economic framework, there was a need for further application of his approach to the evolution of waste management policy in large cities. Such a view is broadly consistent with that of Melosi (1993:18) who, in a review of studies of the environmental history of cities, observed that: 'the study of environmental policy-making in cities is still in its infancy and the study of environmental regulation as it pertains to cities still lacks comprehensive treatment'.

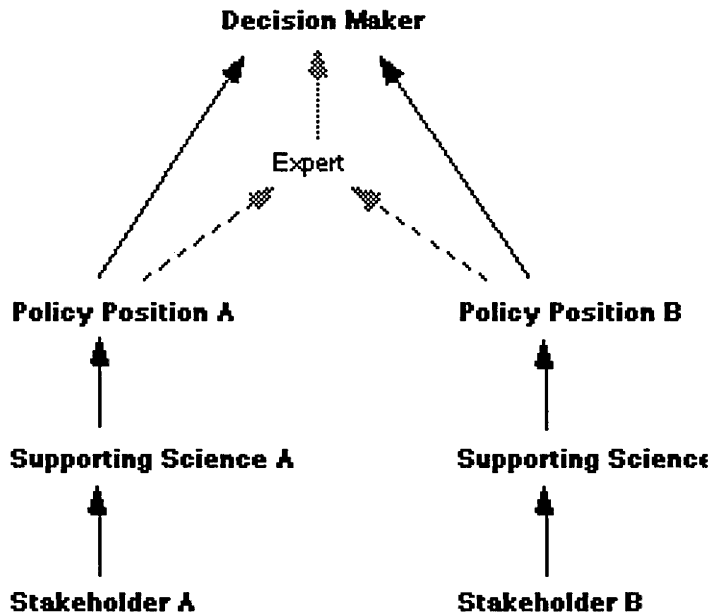
2.5.3 Empirical Generalisations

Ozawa (1991) described a number of policy disputes, not so much as theoretical studies, but rather to promote the use of consensual procedures in public policy-making under scientific uncertainty. One of the disputes involved waste disposal by incineration and Ozawa made some generalisations about the relationships between science and politics in environmental policy-making. Firstly, she argued that in most cases the use of science in environmental policy-making can be schematised as shown in figure 2.2. The lighter arrows signify that in some situations, when the science supporting two conflicting policy positions is also contradictory, decision makers may refer the question to an expert in the field before making their decision.

Ozawa suggests there has been an increasing trend in American legislatures for scientific findings to be the justification for formulation of public policy. Prior to the Roosevelt administration, science figured but rarely in government decision-making.

The New Deal agencies marked the entry of science into public policy-making and the rationale for the formation of such agencies was that they enabled the employment of technical experts with the required scientific knowledge (Ozawa, 1991:3-4).

Figure 2.2: Schematic representation of the role of science in environmental policy-making. (After Ozawa, 1991:Figures 2.1 and 2.2, pp.29-30).



This form of policy-making has logical positivist underpinnings and assumes that science is objective and neutral. Therefore any discrepancies in the supporting science brought to the decision by stakeholders must be due to error, which then may be an incentive for decision makers to seek further scientific assessment to uncover the source of error and validate one or other of the policy positions. However, the discrepancies may not be so much due to error as to expert, but nonetheless subjective, judgements about uncertainties on the part of those providing scientific support.

The facilitated one day policy dialogue on the Brooklyn Navy Yard incinerator was instrumental in surfacing the source of the 240-fold discrepancy in the cancer risk estimates between the Hart Report and the Center for the Biology of Natural Systems. At the time of the incinerator proposal, there were three competing theories of dioxin formation in municipal waste incinerators. The Hart Report dismissed the theory that dioxin is synthesised from precursors at points beyond the combustion chambers and in the smoke stack. The two remaining theories posited that the formation of dioxin was influenced by conditions in the combustion chambers. Accepting this view, the Hart Report produced its estimates by selecting from among the incinerators for which data was available, the two which had combustion chamber designs similar to the

proposed incinerator. The Center for the Biology of Natural Systems, on the other hand, subscribed to the theory rejected by the Hart Report. Accordingly, it then was logical to base its estimates on data from all the nineteen incinerators for which data was available (Ozawa, 1991:51-57). The discrepancy in the cancer risk estimates had its origins in the choice of incinerator data assumed to be representative of the proposed incinerator.

Ozawa maintained that in the absence of consensual procedures like the facilitated policy dialogue, there is little incentive for the discovery of the origins of the differences in scientific assessments. Indeed, it may be in the interests of those providing the supporting science for a policy position to deliberately conceal the assumptions underlying the analysis, leaving agency staff with the arduous task of meticulously working through competing assessments in an attempt to reconcile the differences (Ozawa, 1991:33-36).

The second result of science supported environmental policy-making in the face of uncertainty is that legitimate political concerns may be submerged by the focus on the science. Ozawa suggests, for example, that some of the opposition to the Brooklyn Navy Yard incinerator may have been on the grounds that it was an 'end-of-pipe' solution that did not attempt to reduce the amount of waste generated. However, once decision-making was set in the adversarial mould, there was perceived to be a greater chance of defeating the incinerator proposal by concentrating on the health issue. Consequently, not only was a legitimate political demand lost sight of, but the possibility of alternatives to incineration was left out of consideration. Finally, as more science is brought to bear on the justification of each side of a dichotomous choice, the sunk costs make it difficult to change tack to new alternatives (Ozawa, 1991:37-39).

2.5.4 Positivist Approaches

Waste management policy can be theorised as the adoption of a particular policy by a government, with the act of adoption being related to a series of independent causal mechanisms. Feiock and West (1993) used this approach in a regression analysis of the adoption of recycling programs in USA cities. Feiock and West reviewed the local policy adoption and urban politics literature and concluded that the various influences on local policy adoption that had been identified to that time could be condensed into distinct groupings.

- The need/responsive policy making model posits that the adoption of local policies is simply in response to an 'objective need' (p.400) for the policy.

- The diffusion of innovations model depends on the concept that some local governments are intrinsically more or less innovative that others.

- The political institutions model assumes that factors such as electoral competition between political parties, electoral arrangements, relationship between elected councillors and management, and executive leadership are important in determining the adoption of policies by local government.

- The Federalism model places its emphasis on the hierarchical arrangement of Federal, State and local government, positing that actions by the first two, such as coercion, provision of incentives, and technical assistance have a strong influence on the policies adopted by the third.

- The economic model posits that fiscal capacity is the pre-eminent factor influencing the adoption of policies by local government.

- The interest group model sees the mobilisation of interest groups as an important influence on policy.

- Administrative capacity determines the extent to which local government has the expertise to undertake the information gathering and assessment of policy options necessary for the introduction of new policies.

Feiock and West operationalised each of these explanatory concepts into numerical indicators. Values for these were obtained from secondary sources and mail survey for 818 USA cities and a series of probit models used to assess the importance of the various explanatory concepts in predicting the incidence of adoption of kerbside recycling in the cities. The models provided the greatest support for explanations of policy adoption based on response to need, electoral competition by political parties, fiscal capacity and interest group organisation.

2.5.5 Concluding Comments

Even the most casual comparison of the existing studies of the evolution of waste management policy discussed above with the body of theory that has developed to explain public policy-making in general, and environmental policy-making in particular, would suggest that there remain many unexplored avenues — a conclusion also reached by Gandy and Melosi in their studies reviewed above.

As modern waste management policy-making revolves around a number of environmental aspects, it might be argued that the first place to start in expanding the range of theory brought to bear on waste management policy would be with theories of environmental policy-making. However, it might be expected at the outset that these theories may have some difficulty explaining all waste policy-making, because they tend to have their origins in the events of the latter half of the 20th century, whereas waste policies were being debated long before the advent of modern environmental concerns. This suggests that a focus on theoretical aspects of waste policy-making might also be of value in testing the applicability of theories about environmental policy-making in a policy domain which may have received less attention than domains such as nuclear power or nature conservation.

2.6 Theories of Environmental Policy-Making

While it is common to regard the late 1960s as the time when environmental issues first became a permanent and substantial presence on political agendas, and so the time from which environmental policy-making became a serious preoccupation of government, a range of public policy-making about issues that would now be regarded as environmental issues was occurring well before the 1960s. For example, in the United States, Federal legislation concerned with forest preservation was passed in 1891, national park management in 1916, oil pollution control in 1924 and water pollution control in 1948 and 1956 (Costain and Lester, 1995:29). In Australia, the first part of the Royal National Park south of Sydney was reserved in 1879, and the Queensland and Tasmanian Governments introduced legislation for the creation of National Parks in 1906 and 1915, respectively (Fisher, 1993:14-15).

Prior to the 1970s, very little, if any, of the environmental policy-making of the time was singled out for study as a separate area of public policy-making (Lester, 1995:2). However, with the upsurge in the late 1960s of popular, media and political interest in environmental issues, and the subsequent institutional change, environmental policy-making became visible as a topic of study, not only by those with in interest in public policy-making, such as sociologists and political scientists, but also by environmental scientists provoked by their perceptions of the urgency of the problem to criticise existing institutions and propose remedial policy prescriptions (see, for example, Odum, 1971). For the latter group perhaps, there was little concern over the question of whether the environmental issues of the late 20th century are so different from any issues of an environmental nature in earlier times, or are so different from other issues that are the subject of public policy-making, that the existing body of knowledge about public policy-making can be ignored.

For social and political scientists, however, this is a question of some importance. If it is believed that modern environmental problems are no more than slightly larger versions of the sorts of impacts that humanity has always had upon the environment, then one will have confidence that the existing corpus of theory will be able to be fruitfully applied to environmental problems. For example, environmental economists perceived environmental issues to be no more than problems of scarcity of environmental quality and moved quickly to apply the understandings of neo-classical economics about scarcity and markets. This gave rise to an environmental policy literature, a small part of which is concerned with waste problems, as described briefly in section 2.3 above.

It also can be argued, as do Doyle and Kellow (1995:52-53, 271-272), that the fundamental questions that lie at the core of environmental issues are no different to questions that have long been the concern of political ideologies, such as the extent to which the state should use its powers of coercion to limit individual behaviour, or matters of distributive justice. They find support for this view from Walker (1989:25), as well as pointing out that environmentalism can be seen as part of broader critiques of technology. However, they also refer to Paehlke's (1989) view that environmentalism is distinctive in its focus on technological choices, and the criteria for assessing these choices and their unintended consequences.

For multi-paradigm disciplines in the social sciences, there are likely to be disputes as to which paradigm can best explain what is occurring as societies respond to the emergence of environmental issues. For this reason, some extensions of existing theory to environmental matters could be viewed, at least in part, as paradigmatic ambit claims — Dickens (1992), for example, as a claim for critical realism or neo-Marxism, or Hannigan (1995) for social constructionism, or Lester (1995) for logical positivist political science. Others have perhaps been more selective, seeking to demonstrate through empirical enquiry the utility of specific theories or methodologies rather than complete paradigms. Hajer's (1995) extension of the discourse analytic and argumentative traditions of Foucalt, Harré and Billig to acid rain policy evolution in the UK and the Netherlands and Williams and Matheny's (1995) study of hazardous waste regulation with its postmodernist underpinnings could be taken as examples this approach.

It might be held, however, that modern environmental problems are fundamentally different from those of the past and signal a discontinuity in the progress of modernisation and industrialisation. In this case, there will be doubts as to whether existing theory, itself a product of modernisation and industrialisation, can engage at all with modern environmental issues, let alone provide useful insights. This latter belief was, of course, central to the rallying calls for the ecologising of sociology and sociologists that occurred in the 1980s (see, for example, Dunlap and Catton, 1980). A similar argument has also been put by Dror (1986:2) that policy science had its origins during the post-war period of prolonged economic prosperity, so that inadequate attention had been paid to policy making under the adverse conditions of the late 20th century.

Others, rather than attacking existing theory head-on at the outset, arrive at the point of being able to set much of existing theory aside through a quasi-grounded theory approach, combined in some instances with the importation of quite specific theoretical perspectives from novel disciplinary directions. Luhmann's (1989) account of self-referential systems of communication and its debt to neurophysiologist Maturana's concept of autopoiesis (Maturana and Varela, 1980) is an example of this approach.

In the following review of theories of environmental policy-making, the departure point is the logical positivist accounts of environmental policy making that see policy output as a dependent variable whose behaviour can be accounted for by a range of explanatory independent variables. These largely

ahistorical explanatory factors provide, as it were, a map of the terrain which displays the main features that are relevant to an understanding of environmental policy making. From this sketch map, it is then possible to move to more historical and process-oriented accounts that may be relevant in improving the understanding of solid waste policy making.

2.6.1 Influences on Environmental Policy Making

The review in appendix B2.6.1 is a simple description of the various influences on the formation and implementation of environmental policy that have been described in the environmental policy literature. Such influences include: the diffusion of ideas from other policy domains, the constraints imposed by political ideology, the nature of the distribution of responsibility between various levels of government and the relations between those levels, environmental groups, environmental innovation by firms, the political party in government, the electoral system, the nature of the state agencies charged with implementing policy, the media and public opinion. Many of these were relevant to the features of waste management policy summarised from existing studies in the dot points in section 2.4, above. One important exception was the role of bureaucracies which has been extensively studied in relation to environmental policy but not, it seems, in relation to waste policy.

2.6.2 Theories of Evolution in Environmental Policy Making

The review in the first part of appendix B2.6.2 examines some of the theories of long term change in other areas of public policy that might be applicable to environmental policy-making. It appears that the variation over time in the USA in public concern over, and political attention to, environmental issues is not particularly well explained by either the theories that find some support in other domains of public policy making, or by theories relating to the emergence and disappearance of social problems. Costain and Lester (1995:34-35) suggest that, in contrast to these other domains, environmental policy making has been characterised by: an increasing penetration of environmental concerns into many of the institutions of society (the 'institutionalised environmental movement' of Morrison, 1986, or the 'institutionalisation of environmental concern' of Langton, 1984); by substantial change in how environmental problems are framed, evaluated and responded to; by increasingly favourable

public opinion (which experiences periods of decline, but never declines to the level prior to an upsurge in support); and by growing involvement in environmental management of grassroots organisations and of levels of governance below the national level.

Ecological modernisation

The change in how environmental problems are framed, evaluated and responded to is central to the concept of ecological modernisation. Ecological modernisation was mentioned in the first part of appendix B2.6.1 as a source of ideas in particular domains of environmental policy making. However, as a theory of social change (see, for example, the account by Spaargaren and Mol, 1992, which draws on Huber, 1982, 1985, 1989, 1991), it is also relevant to the task of understanding change in environmental policy over time. Ecological modernisation is seen as the third of three phases in the history of industrialisation:

- the industrial breakthrough,
- the development of industrial society, and
- the ecological switchover.

Central to this last phase in Huber's view is the emergence of new clean production technologies (such as micro-electronics, biotechnology and new materials) and the placing of monetary values on nature. Spaargaren and Mol argued that, with ecological modernisation, environmental policy making changes its emphasis from end-of-pipe solutions to preventative measures. The tools of ecological modernist environmental policy are such things as environmental auditing, clean production, life cycle analysis and energy and materials efficiency, compared to regulation and emission standard setting that dominated environmental policy in the 1970s. Spaargaren and Mol also claim that, at least in the Netherlands, ecological modernisation is characterised by a shift by the environmental movement away from its idealist anti-industrial stance towards a more pragmatic accommodation with industry.

It is worth noting that ecological modernisation, while often regarded as a feature of the late 20th century, is not without its historical antecedents. The president of the American Institute of Chemical Engineers, Samuel P. Sadtler, in an address to the Institute in 1909 elaborated on some of Frederick Taylor's

ideas about scientific management, arguing that resource development passed through three stages, discovery, wasteful exploitation and the conservation stage which society was then moving into. This stage was dependent on the expertise of chemical engineers who, by improving the efficiency of production processes could both conserve resources and recover valuable byproducts for industry (Raufer, 1998:93-94).

Modern environmental problems can be categorised according to their position along the flow of materials and energy that starts with resource extraction, moves on to resource processing, manufacture of finished goods, the marketing of these goods, their use and eventual discarding, the accumulation of such discarded materials as waste and the diffusion of at least some of the substances in waste back into local, regional and global biogeochemical cycles. With such a concept of the materials and energy basis of the economy, it is possible to distinguish between upstream problems, such as the environmental impacts of mining, and downstream problems, such as the environmental effects of landfills. In a broad sense, ecological modernist environmental policy attempts to solve environmental problems by shifting the focus of policy further upstream. For example, techniques such as environmental auditing and life cycle analysis attempt to make changes in production processes to avoid environmental impacts further downstream when products are used and disposed of.

However, Wynne (1992:117-118) argued that the further that the policy focus is shifted upstream, the greater the degree of difficulty in predicting what the ultimate environmental outcomes of policy options will be. This is because with an upstream focus, there is a greater involvement of essentially indeterminate social factors. For example, the control of leaching from landfills with liners and impermeable caps has a reasonably predictable effect on the environmental impact of the landfill. Social factors are largely irrelevant to the performance of these remedial measures. But if the effort in improving landfill performance was shifted to, say, encouraging consumers to reject excessively packaged goods, the ultimate environmental effect of this is essentially indeterminate. Firms who felt their interests threatened by public awareness campaigns about excessive packaging might respond by developing packaging with a specific re-use function, or they might decide that placing pressure on government by threatening job losses might be a more successful strategy. Consumers might see the publicity as unwelcome government intrusion into freedom of consumer choice and register their disapproval by responding in the

opposite way intended. Each of these events could have impacts on the waste stream that are quite different in their timing, volume and ultimate environmental impact. The actions of the actors involved cannot be determined in advance and, consequently, prediction of the environmental outcomes is not just uncertain, but impossible. Even if all environmental impacts could be determined, there still remains, as Ackerman (1997) has documented in great detail for packaging choices, the problem of non-comparability, i.e. the impossibility of comparing various expressions of environmental impact, such as amount of carbon dioxide emissions, or of hazardous substances, in a single physical metric.

Risk and reflexive modernisation

Wynne's arguments have much in common with those of the 'risk society' theorists, such as Ulrich Beck and, more recently, Anthony Giddens. The theory of the risk society (if it has sufficiently matured to be labelled as such) applied to the question of the evolution of environmental policy, would point to two important trends as possible foundations for explanation. Firstly, it posits there has been a shift in the types of risks that are the preoccupation of government and politics, from securing the populace against the unpreventable risks of nature (such as floods, droughts and storms — termed external risks by Giddens, 1998:27) to the attempted prevention of the 'manufactured risks' that are inevitable in a modern technological society (Beck, 1998:12; Giddens, 1998:28). Some care needs to be taken in this distinction, especially if it is to be symbolised as 'the end of nature' (see, for example, Beck, 1998:10; Giddens, 1998, 26), in which there is no longer an external nature unaffected by human action. Regardless of whether nature is in an original state, or some anthropogenically altered state, it is still nature that is responsible for conveying the harms of modern industry from their point of production to the individual who suffers the consequences (for example, the transport of toxic chemicals in groundwater or the transport of organochlorines from equatorial to polar regions by global atmospheric circulation). This involves the exceedance of thresholds of environmental assimilative capacity — at some point as volume of emissions of pollutants increases, the processes of nature switch from being insulators or buffers between the producers of pollutants and the rest of society, to being conveyors of harm (Reeve, 1998). Nature is as important in external risk as it is in manufactured risk. Furthermore, in modernity, nature continues to wreak havoc through floods, droughts and

storms — indeed, there are suggestions that global climate change is increasing the magnitude and frequency of these events. If this is so, then it is not so much that state endeavours to protect the populace from risk are switching from external to manufactured risks. Rather, the external risks are becoming manufactured risks. In addition, as alluded to above, Douglas's (1966) account of perceptions of danger in traditional societies shows that disease and disasters are frequently attributed to transgressions by individuals of the moral and civic order — making such dangers in every sense manufactured risks, but by social behaviour rather than by technological behaviour. This suggests that characterisations of the risk society as 'the end of nature' and as a transition in the attentions of the state from external to manufactured risk may be attempting to pack too much into the one transition. It may be more useful to think in terms of two transitions.

In the first transition, a traditional risk society where all risks were manufactured by transgressions of the moral and civic order required by religious beliefs, was replaced by a post-Enlightenment, pre-modern society where, with the aid of Baconian science, a subset of risks were separated out as being external, and unavoidable but perhaps calculable. In this early industrial world, external risks could be insured against, and the natural processes that provided the insulation and buffering between the technological and industrial activities of individuals were, unbeknownst to the state, relieving it of a considerable burden of coordinating and political effort.

The second transition has brought a return to another sort of risk society, a late industrial risk society, where most of the risks are manufactured by progress and modernity itself, through outstripping the insulating and buffering capacities of natural processes. As these processes begin to transmit harm between individuals, the burden of coordinating and political effort falls on the state. These natural processes become a focus of political attention — as have the transport of pollutants in water and the atmosphere, the chemistry of the ozone layer, and global atmospheric processes. As noted in the 1992(a):82 translation of Beck's 1986 account of the risk society 'nature has become *political*' (emphasis in original). The greater ability of manufactured risks to sensitise people to the failure of the state, compared to the risks of natural disasters, is well documented for toxic waste problems (see, for example the discussion of Brown and Mikkelsen, 1997:110-124).

The second trend that defines the risk society is the growing criticism of progress and science. In reflexive modernisation, progress is about questioning, anticipating and responding to the unintended ills of progress, while the methods of science are turned to the criticism of science itself (Beck, 1992(a):155-182). The more science that is brought to the task of anticipating the consequences of scientific and technological progress, the more uncertain the future appears, and the more threadbare the cloak of scientific reassurance for the politician seeking to legitimate policy decisions. As Giddens (1998:29) observes, the politician of the risk society faces a no-win situation. Careful precautions that turn out to be unnecessary expose the politician to accusations of scaremongering. Failure to take precautions that are later found to have been necessary open the way for accusations of covering-up. The politics of the risk society brings morality, distrust of authority and science, and the social construction of hazards to certain domains of policy making that formerly occurred in a climate of ostensible objectivity and trust in authority and science. This is nowhere better seen that in the politics of toxic waste management. In what seems almost as a sketch of the contours of the risk society, but written a year prior to Beck's seminal account of it, Vyner (1985) observed:

> *Toxic waste directly assails several fundamental social beliefs: that humans have dominion over nature; that personal control over one's destiny is possible; that technology and science are forces of progress only; that risks necessary for the good life are acceptable; that people get what they deserve; that experts know best; that the market is self-regulating; that one's home is one's castle; that people have the right to do what they wish on their own property; and that governments exist to help.*
>
> (Vyner, 1985:11-12,
> cited by Brown and Mikkelsen,1997:59)

From the perspective of the theory of the risk society, it might be expected environmental policy making over time will show, at least in domains where risks are important, more attention to anticipatory policy, increasing distrust in authority and scientific expertise by those affected by policies and increasing attention to moral issues in political discourse.

The views of Wynne and the risk society theorists on the one hand and the ecological modernist school on the other provide conflicting perspectives on the likely outcome of evolution of environmental policy towards more anticipative and preventative approaches. It could be inferred from the former that such change in environmental policy might lead to more contested, confused and politicised policy making due to the inability of scientific analysis to provide clear indications on the merits of particular policy options. Such conditions

might also be expected to lead to delays in the formation of policy and so the exacerbation of environmental problems. From the ecological modernist perspective, the change in policy focus should lead to more expeditious formation of policy, due to the wider appeal of preventative solutions.

Lack of change over longer time periods

The review in the second half of appendix B2.6.2 deals with theories of lack of change in environmental policy making. The theme that emerges here from a number of authors is that industry power and conservative governments, both separately and in concert, have played an important role in thwarting the changes in environmental policy that other groups regard as necessary to protect the environment. Of course, there are exceptions, political awareness of pro-change public opinion, for example, being an important factor that has resulted in environmental policy-making against the perceived interests of business and industry.

2.6.3 Theories of Process in Environmental Policy Making

Theories of process in environmental policy making also focus on the time dimension, but on the sequence of steps that leads to policy formation, rather than changes in the nature of policy over time. The first three subsections in appendix B2.6.3 would probably be more aptly described as observations about environmental policy-making processes. These include the observation that policy makers often attempt to transform environmental conflicts into technical assessment procedures to avoid the irreconcilabilities of economic and ecological logics; that governments set targets on particular environmental indicators in the absence of a clear understanding as to whether the targets are feasible, for the purpose of signalling to industry the seriousness of the government's intent; and that when faced with difficult environmental issues, governments engage in electorally soothing symbolic actions such as public inquiries, information campaigns or creating new agencies

The remaining subsections in appendix B2.6.3 deal with more comprehensive accounts, all of which acknowledge that the various actors involved in environmental policy have their own constructions of social and environmental reality. These studies show the critical importance of discourse, both in the

how particular situations come to be seen as environmental problems, in what counts as solutions, and in the politics leading to policy responses. Existing institutions, broadly defined, are also of great importance in shaping what forms of knowledge and problem framings are brought to policy discourse, and in shaping the opportunities for the strategic positioning, argumentation, negotiation and compromise that are necessary in bringing some sort of closure that can lead to policy responses. Some authors, such as Rushefsky (1995) and Papadakis (1996) place emphasis on a sequence of steps between problem perception and policy formation. For Hajer (1995), it is not so much the sequence of steps as the evolution of the policy story line that is important in explaining policy formation.

A theme connecting a number of the studies reviewed, is the role of simplifications in various forms, from story-lines, to generative metaphors, to binary codes. The complexities of modern environmental problems, and their location within structurally dependent webs of interests that can be conflicting or reinforcing makes some form of simplification inevitable if such problems are to be dealt with politically. However, what is not so clear, is whether such simplification obstructs or facilitates policy response to environmental problems. From Luhmann's (1989) perspective, the binary codes and self-referential discourse of societal subsystems can hinder society's response to environmental problems. Similarly, Williams and Matheny (1995) attribute the policy paralysis over hazardous waste facility siting to the incompatibilities of the managerial, pluralist and communitarian discourses associated with particular groups of actors with interests in the siting outcome. On the other hand, Hajer and Schön and Rein draw attention to the facilitatory role of normative dualisms and generative metaphors as problems move from their initial description in lay and local administrative discourses towards discursive closure in higher level political discourses. In this respect, Papadakis (1996) emphasises the importance of constructive dialogue, and the institutions that make such dialogue possible.

2.7 Some Relevant Insights from the Public Policy Literature

The final part of the literature review in appendix B2.7 draws attention to the relevance to environmental policy-making of some well known models of public policy-making that can serve as ideal types that may characterise policy-making at particular times or in particular locations. However, it would appear

that there are equally many times and places when policy making cannot be explained in terms of the these well known models of public policy making, and environmental policy making is no different in this respect. While Kingdon's streams and windows model has a richer time dimensionality that is attractive to an historical study of policy formation, but lacking from rational-comprehensive, incremental and garbage can models, it also has its shortcomings. Perhaps its greatest strength is its attention to what others might pass off as mere contingent events.

2.8 Research Questions

A number of conclusions have been drawn from the literature review.

Firstly, it is asserted that neither the social science literature nor the technical and economic literature on waste management provide a comprehensive and cohesive theoretical framework for the understanding of the evolution of waste policy. Walker (1992:251-252) drew a similar conclusion for environmental policy after reviewing a number of case studies in this area. While it might be held that such a framework is an impossible ideal, this is not to say that some progress towards such an ideal might be both possible and an improvement on the present situation.

Secondly, the broad empirical features of the formation of waste policy, both on long and short time scales have been adequately described and these share some features with environmental policy generally. There appears to have been, however, no studies undertaken of the formation of waste policy over time in a large Australian city.

Thirdly, theoretically oriented studies of the evolution of waste policy are relatively rare, and none have paid much attention to the social construction of waste policy problems, despite some evidence from the work of Douglas and others that there may be potential in such an approach. Support for optimism about this potential comes from a number of studies of the evolution of environmental policy that have asserted that considerable explanatory power is to be found in analysis of policy discourses.

Fourthly, theories of change in environmental policy-making, with a few exceptions such as Downs' issue-attention cycle, tend to be prisoners of their

own origins in the rise of modern environmentalism in the late 20th century. Consequently change is viewed as linear — from the industrial modernity to reflexive modernity as seen by the risk theorists, or from industrial modernity to ecological modernity as seen by the ecological modernists. The possibility of a degree of cyclicity appears not to have been entertained. Similarly constructionist studies of a particular environmental problem, such as acid rain or hazardous waste, tend to focus on the problem identification and policy response phase and leave unattended subsequent implementation, its shortcomings and the emergence of new problems that continue the evolution of policy. This is not to say that the approaches taken cannot be applied over the longer time periods spanning several cycles, if such cycles exist, rather that the approach has not been tried.

Waste issues, because they have had an existence long before modern environmental issues, should be a fruitful testing ground for extending the theories of environmental policy-making that have arisen in the last 30 years of the 20th century. Furthermore, waste management in Sydney during the 20th century, with its periods of crisis, with the distribution of waste management responsibility between local government and State Government and with all the dynamics of late 20th century risk politics appears to have the diversity of policy-making conditions that afford a reasonable potential for comparison across time periods, as well as a reasonable potential for the generalisability of any findings to other large modern cities.

The question that this thesis sets out to answer is whether the formation and evolution of public policy for the management of solid waste in the city of Sydney in the period 1900-1996 was affected by changes in the understanding among the general populace of waste substances and waste places and, if so, in what way.

There are, however, in addition to this question , a number of supplementary research questions which would allow for a fuller account of the formation and evolution of waste management policy. These questions include:

- whether waste policy making may sometimes be a form of moral panic over deviant matter,
- whether the various dualisms, binary codes and story lines that occur in waste policy discourse have a role in problem closure, policy formation and policy paralysis,

- how realist and structuralist accounts of waste policy formation and evolution might relate to each other, and
- whether Beckian and ecological modernist theories of long term change in environmental policy making are supported by the history of waste management in Sydney.

Because there was no reasonably comprehensive account of the history of waste management in Sydney, it was difficult to determine in advance the specific aspects of this history needed in the study of waste policy evolution. Consequently, it was anticipated that the compilation of the history of waste management in Sydney could well provide insights into the importance or otherwise to waste management policy making of the range of influences on environmental policy making that have been proposed in the past. In addition, it was anticipated that the compilation of the history of waste management could also lead via inductive reasoning to conjectures about explanations for waste management policy formation that lay outside the questions posed above.

3 METHODOLOGY

3.1 Overview of Methodology

The aims set for the study in section 1.2 span the full range from micro-level social processes, such as the meanings of waste for individuals, through to macro-level processes, such as ecological modernisation. Both levels of concepts could potentially be operationalised as quantitative variables, e.g. the proportion of a sample of the population of Sydney agreeing with a particular statement in a survey, or the proportion of environmental legislation with a preventative approach, measured in pages on the statute books. Both levels of concepts also have the potential to be examined qualitatively. Further, the literature review itself demonstrates that the study of waste management can be undertaken in any one of a number of social science traditions from, for example, the constructionist and ethnographical approach of Douglas (1966) through to the logical positivist approach of Feiock and West (1993). The approach that has been taken in this study is one of methodological pragmatism, which avoids turning a particular research topic into a re-run of the age-old inter-paradigmatic battles of the social sciences. Rather, as Crump (1995) has argued for educational research, the methodological pragmatist uses the research methods of any of the paradigms where circumstances would recommend it, being aware of the strengths and weakness of each, and avoiding distraction by the irreconcilability of the philosophical underpinnings.

If it was necessary to attach a convenient methodological label to this study, it would be historical-comparative research. Of the list of characteristics given by Neuman (1997:388-392), there are a number that are similar to the approach taken here:

- use of a diverse array of sources of its data, from both the micro-level and the macro-level,
- a focus on time and process,
- data is limited by what has survived from the past,
- the approach to causality is more contingent than determinist, and
- generalisations are inferred from the comparison of action in different contexts

Before proceeding to a description of the sources used in the study, it is necessary to clarify the meaning of the terms 'primary' and 'secondary'. The following discussion is drawn from Neuman (1997) and Potter and Wetherell (1987).

The terms 'primary' and 'secondary' refer to different types of sources in different research traditions. Within the logical positivist tradition in sociology, for example, primary sources of data are those created by the researcher through surveys, interviews, observations of behaviour and so on. Data drawn from printed sources, such as newspapers or works by other researchers is regarded as secondary data. Within this tradition primary data is valued because it can be 'objectively' measured by the researcher and is closer to the 'reality' that the researcher wishes to study.

For similar reasons, historical research places greater value on primary sources, but in this tradition, newspapers, letters, government documents etc count as primary sources, while accounts by other historians are secondary sources.

The historical-comparative research tradition draws a similar distinction between primary and secondary sources. However, within this tradition, it is acceptable for research to be based on a mixture of primary and secondary sources. It is recognised that, given the need to cover broad areas of study across long periods of time, it is efficient to use accounts by historians as empirical sources, rather than locate and revisit the original primary sources used by those historians.

To a significant extent in the social constructionist tradition, and particularly in the discourse analytic tradition, there is almost no distinction between primary and secondary sources. Texts are the empirical sources that are studied, and little distinction is drawn between texts in naturalistic records, such as newspapers, Hansard, or books by researchers, and texts generated by the researchers own interactions with others, such as transcripts of interviews or of focus groups. Indeed, greater value can be placed on naturalistic records because there is no opportunity for these sources to be affected by interaction with the researcher, whereas the text derived from interviews can be so affected.

The historical account of waste management in Sydney depends on what historians would regard as secondary sources (for example, MWDA annual reports, books by other researchers on the environmental and local government history), as well as upon primary sources (newspapers, Hansard). For that part of the thesis that deals with the influence of the social construction of waste on solid waste management policy, these same sources would all be regarded a primary sources. The only possible secondary sources for this part of the research would be other constructionist accounts of the influence of the social construction of waste on the evolution of solid waste management policy in Sydney. As chapter 2 concludes, there have not been any studies of this nature to date. However, for the parts of the thesis that take a realist approach to the influences on waste management policy, most of the sources used would be regarded as secondary sources. Only the focus groups and interviews would be regarded as primary sources.

Given that the study aimed to cover just under one hundred years of waste management in Sydney, ease of use of documentary sources was an important consideration. Large unsorted collections of primary documents, such as are held by the New South Wales State Archives and some local governments in Sydney, are a formidable barrier to research that is concerned with more than a few years and that has to be completed in a relatively short period. In addition, the former source, because of the 30 year rule, was not available for government documents dated after 1969, which is the period when the most institutional change took place in waste management in Sydney.

Ease of access is also an issue for newspapers as documentary sources in research on a topic that is likely to be reported only occasionally. The *Sydney Morning Herald* (SMH or the *Herald*), for example, carried of the order of 500 000

pages of news articles over the duration of the 20th century. Assuming these pages were scanned on weekdays over a two-year period, the researcher would need to scan 1000 pages each day to cover the 20th century. For this reason, documentary sources that are furnished with a comprehensive index have to be favoured.

For these reasons, the study is based largely on a number of documentary sources that were readily accessible, and/or well indexed. These were the *Sydney Morning Herald*, a daily newspaper with a wide circulation and generally regarded as conservative in its reporting, *Hansard* for the New South Wales Parliament and the annual reports of the Department of Health, the Department of Local Government, the Metropolitan Waste Disposal Authority (MWDA), its successor the Waste Management Authority (WMA) and its successor the Waste Recycling and Processing Service (WRAPS or the Waste Service). Other documentary sources included government policy documents, reports from government inquiries and articles by Sydney waste management professionals at conferences held in Sydney. A range of books and articles on the history of Sydney that contained reference to waste management were also drawn upon.

With a reliance on the sorts of public documents described above, historical policy studies are susceptible to the critique of the critical realist who argues that little explanation will be found in the public record — that the real reasons for policy action should be sought among the secret deals in back rooms, the webs of political intrigue, hidden agendas, vested interest and personality politics. There are two responses to this argument. The first is that to abandon historical policy research for this reason may amount to throwing the explanatory baby out with the methodological bathwater. If the public record is interpreted with care, having in mind at all times that there always be more to it than meets the eye, then it may be possible to form some tentative explanations for further testing, which could be considered preferable to no explanations at all. The processes of internal and external criticism of individual documents (see, for example, Neuman, 1997:401-402) take this approach.

The second response is to argue that, for the longer time periods of interest to a historical study, devious manoeuvring out of sight of public view by those with an interest in policy outcomes, operates at a different level to the processes for which explanation is sought. As Hajer (1995:59) and Schön and Rein (1994:27-29) argue, those doing the deals in the back rooms still have to understand their

interests within the problem framings of the time. What is of interest is not how the deals are being done, but why the problem framings within which they are done might be different at one time to another.

A practical response to the critical realist's critique is of course, when policy research does not involve the too distant past, to complement the public record by recourse to the actors involved in the events of interest, to elicit their recollections of these events, their feelings about them and their interpretations of the meaning of the events. However, from the constructionist viewpoint, such sources may be inferior to documentary records from the past, because of the individual's tendency to re-frame their recollection of past events in terms of the current frames through which such events are understood.

The study did, however, gather some validatory and supplementary data from individuals, by undertaking three focus groups and a number of telephone interviews with key informants associated with waste policy in Sydney. The main aim of the focus groups was to assess the validity of a number of inferences that been drawn from the literature reviewed in section 2.2.2 and 2.2.3, and from the study of the media reporting (in particular that in sections 8.1-8.7). It was expected that the focus groups would also supplement the information obtained from media reporting. The main aim of the key informant interviews was to obtain additional information about key events that were insufficiently described by historical sources, and to compare my interpretations of what lay behind some of these events with the recollections of the informant.

Further details of each of the methods used are described in the following sections.

3.2 Media Analysis

The index to articles in the *Sydney Morning Herald* takes several forms — starting with quarterly volumes listing articles by subject and prepared by the newspaper itself from January 1930 to 30 September 1961. From 1 October 1961 to 31 December 1978, the index comprises a series of physical index cards, one per article, prepared by the staff of the New South Wales State Library and transferred photographically to microfiche. A second set of microfiche covers similar index cards for the period 1 January 1979 to 31 December 1987. From

1988, SMH articles are referenced in a database called the Infoquick Service with a World Wide Web interface located at (on 31.5.2000):

http://www.slnsw.gov.au/infoquick/welcome.htm

This database is searchable by subject and returns listings of SMH articles, including the headline, date and page number. Infoquick also references the *Sun Herald* and *Good Weekend* for the same period.

There are some differences between the index volumes, the microfiche index cards, and the Infoquick database. Most notably, the index volumes appear to reference all letters to the editor and editorials. The first microfiche referenced some letters to the editor and editorials. The second microfiche and the Infoquick database do not reference letters. Also, as described below, there are considerable differences in the arrangement of subject headings across the all the indexes. For these reasons, letters to the editor were excluded from numerical analyses.

An Excel 4 database of SMH articles relating to solid waste management was compiled for the period 1 January 1930 to 18 September 1997. The database fields included, reference index identifier, subject heading in reference index, date of article, page number of article, type of article (article, letter to editor, editorial), journalist's name where given, and the description of the article provided by the index. The search strategy used varied according to the type and date of index. Prior to the 1950s, all articles about solid waste issues appeared under the subject heading of 'Local Government'. During the 1950s, the range of subject headings proliferated, and the rise of modern environmentalism in the late 1960s resulted in a new series of subject headings under which solid waste issues might be described.

For indexes prior to 1950, the search was limited to the 'Local Government' and subsidiary subject headings. For 1950 to 1961, the search was conducted under the following subject headings: 'cancer, cancer causes, chemical, factory, garbage, garbage disposal, garbage dumps, incinerator, industry, labour-garbage collectors, labour-municipal employees, local government, parks and reserves, plastic, plastics industry, poisons, rubbish tips, Sydney City Council'.

For 1961 to 1978, the search was conducted under the previous subject headings, together with: 'Australian Industry Council for Environmental

Quality, Australian Environment Council, bottles, chemicals industry, Earth Day, Earth Week, ecology, Ecology Action, Environment 73, environmental policy, factory and trade waste, Friends of the Earth, Inspect Clubs, Keep Australia Beautiful, litter, Metropolitan Waste Disposal Authority, NSW Department of Environment Control, NSW Department of Planning and Environment, pollution, Protect Your Environment Clubs, refuse, refuse disposal, Society for Social Responsibility in Science, soil pollution, Total Environment Centre, water pollution'.

For 1979 to 1987, the search was widened to include the following subject headings: 'carcinogens, chemicals-safety measures, Environmental Law Association, hazardous substances, NSW Land and Environment Court, NSW Parliament Statutes Clean Air Act, NSW State Pollution Control Commission, recycling (waste), salvage (waste), waste disposal sites'.

For articles after 1987, the interlinking of subject headings in the Infoquick data base meant that a search on the terms: 'cancer, packaging, recycling, toxic, waste' captured all the relevant articles.

The information from the index volumes and microfiche was entered into the Excel4 database by hand. The information from the returned search web pages at the Infoquick site was electronically pasted into Word 5 documents and saved as an ASCII text file. A program in Macintosh Chipmunk Basic was written to parse the text files and write only the details on SMH articles to a tab-delimited text file that could be read by Excel 4. A copy of the Basic program is provided in appendix A1.

The SMH articles in the Excel 4 database were assigned to subject categories by examination of the articles on microfilm. This enabled a number of simple plots of the frequency of articles in particular subject categories with time to be obtained.

The examination of media articles provided two types of information for the study. Firstly, the articles provided a record of events related to waste management in Sydney. Where the time, place and substance of events was also described in other sources, such as *Hansard* or government documents, comparison with the *Herald* accounts showed the factual reporting to be of generally good quality, as might be expected from the reputation of the newspaper as mentioned above.

Secondly, media stories can provide an (admittedly imperfect) indication of how waste issues are understood by the public. One story in isolation may not be a good guide, but a whole series of articles over a period of time that frame a waste issue in a particular way can be a reasonable indication that many in the public will also see the issue in a similar way. As Hannigan (1995:47, 69) points out, particular accounts of environmental problems that have prolonged currency in the media tend to be cast in terms that resonate with widely held cultural concepts. The influence can also be in the opposite direction, as Bell (1994) found with misunderstandings of the relationship between the greenhouse effect and ozone depletion having spread from the media to the public.

3.3 Analysis of *Hansard*

Legislative debate and questions to Ministers in *Hansard* for the period 1930 to 1995 were examined in detail. As with the media analysis, the *Hansard* account can provide two sorts of information. Firstly, it provides basic information as to the progress of legislation through the Parliament, as well as information on events of concern that come to political notice and form the substance of questions to a Minister.

Secondly, and more importantly, it provides an account of how complex waste management issues are simplified for political communication, how the logic behind simplified codes and representations works and how the ideologies of political parties interact with this logic.

The indexes in *Hansard,* if followed over time, also provide a record of the rise and fall of public concern about particular issues. For example, concerns about pesticides in the 1960s were initially referenced under 'Agriculture' but in 1967, *Hansard* staff must have decided that a new term 'Chemicals' was preferable. As the number of questions in Parliament about hazardous chemicals and pesticides declined in 1990, the term was eventually dropped from the index. While a detailed numerical analysis would want to eliminate the biases of the indexers, the fact that the term appeared and disappeared is in itself an indication of the emergence and passing of concern.

3.4 Analysis of MWDA Annual Reports

Any organisation with a requirement to provide annual reports faces a tension between the desirability of providing all the information that readers might wish to know and the costs of providing that information. Except for the first report in the organisation's existence, annual reports are always preceded by the previous year's report. For aspects that have not changed significantly between two years, or over several years, organisations can effect some economies by simply reproducing material from previous years. However, where significant changes have occurred, and these are known to the readership of the organisation's annual reports, the organisation will be compelled to report on these changes.

For these reasons, it is possible to develop an account of the significant events in the history of an organisation by examining its reports in historical sequence and identifying where novel content emerges from amongst the surrounding text carried over from previous years.

3.5 Narrative and Themes

With all of this material, the approach taken was to separate the information contained in these sources into that from which a simple narrative account of events in the waste management history of Sydney could be compiled, and that which appeared more directly relevant to the aims of the study. In both cases, notes were taken from the material, directly into word processor documents, from which the chapters following this one were prepared. As described in section 1.3.3, some of these chapters emphasised the course of events in the evolution of waste management policy in Sydney, and others dealt with particular themes of interest. While examining the source material, the names of people who had been extensively involved in the events being described were noted and enquiries made with government departments and other organisations to locate these people. Once a reasonably detailed account of the history of waste management had been prepared, and the areas in which there were shortcomings in the account were evident, preliminary contact to organise an interview was made with those people who had been located.

3.6 Key Informant Interviews

The interviews with key informants were semi-structured, mostly following a pattern where initial questions were about specific events that would be familiar to the interviewee, and later questions were more directed to the interviewee's interpretation of events. The former questions generally related to aspects of the account from the source material that were unclear or conflicting. All interviews were introduced with an explanation of the nature of the study and an undertaking that the interviewees would remain anonymous. The backgrounds of the key informants are shown in table 3.1. Interviews with informants 1, 2, 4 and 7 were by telephone, that with informant 3 was face-to-face and the interviews with informants 5 and 6 were by email.

Table 3.1: Backgrounds of key informants interviewed.

Key informant number	Key informant's background
1	Officer within the Waste Section of the Commonwealth Environment Protection Authority
2	Senior manager with an industry-sponsored litter reduction organisation
3	Academic who had been a member of the Technical Advisory Committee of the SPCC in the 1970s
4	Former senior manager in the Waste Service, Waste Management Authority and the Metropolitan Waste Disposal Authority
5	Member of an environmental group in Sydney who played an active role in waste politics in the late 1980s and early 1990s
6	Member of an environmental group in Sydney who played an active role in waste politics in the late 1980s and early 1990s
7	Senior manager in the New South Wales Environment Protection Authority

It should be emphasised that the primary purpose of these interviews was to supplement the account constructed from documentary sources where there were gaps in areas considered to be of importance to the study. While the interviews did provide some useful insights, it was generally found difficult to obtain an account of events, and of the interviewee's view of these events at the time they occurred, that was uncoloured by more recent events and changes in the way of thinking about waste management issues. Given the relatively minor function of the interviews, and their less than satisfactory contribution to the study, interviewing was terminated after seven interviews had been conducted.

3.7 Focus Groups

As the work on the secondary sources proceeded, it was possible to identify a number of themes in the lay understanding of waste that appeared to be worth more detailed exploration through the medium of focus groups.

Three focus groups were run. One was held with members of a school Parents and Citizens Association near Armidale in northern New South Wales. The schedule of discussion prompts is provided in appendix A2. The Armidale focus group was intended to be a pilot, but was very successful in eliciting the kind of information needed for the study and has been included in the study.

Following transcription and examination of the Armidale focus group discussion, a brief was prepared for the conduct of two similar focus groups in Sydney (appendix A3). The two focus groups were divided according to age, with an under 50 group and over 50 group, with a view to identifying any differences in views among those with experience of landfills in the post-war period. Groups were not divided on socio-economic lines as social class differences in views about landfills were not of interest to the study. A tender was accepted from a reputable market research firm with extensive experience in focus group work and previous experience with waste-related market research.

Analysis of the focus group transcripts was undertaken using word processor software to compile extracts of discussion relevant to each of the themes of interest to the study.

3.8 A Note on Language

In accounts drawn from the types of primary sources used in the study, it is impossible to avoid repeating fallacies of non-equivalence that are endemic in the primary sources. For example, when a Minister reports in the Legislative Assembly that 'The Government has decided ...' he or she is, in strict terms, committing a fallacy of non-equivalence, in that Governments do not decide in the same sense as individuals make decisions. 'The Government has decided ...' is shorthand for something like 'Department X provided a briefing paper to Cabinet, which was discussed by the Cabinet, with a majority of members voting in favour of the recommendation'. To purge an account of these

convenient but fallacious shorthand expressions would be to render it virtually unreadable. In the following chapters, the language of primary sources containing such expressions is retained, with the exception of more extreme examples of endowing higher level conceptual entities with the emotional qualities of the individuals that comprise them, such as 'the Government was upset by ...'.

An allied problem is when terminology changes significantly with time. Those charged with responsibility for 'abating nuisances' caused by 'rubbish tips' in the 1930s did not see themselves as 'managing landfills'. The approach taken in the following chapters has been to retain the language of the time when describing the conditions of the time, but to use current terminology when discussing interpretations of the historical record.

4 THE INSTITUTIONAL FRAMEWORK

4.1 Introduction

The evolution of waste management policy that took place during the 20th century was played out on the stage of an institutional framework, the foundations of which were laid in the 19th century. The first part of this chapter provides a brief summary of the circumstances that gave rise to the fundamental feature of waste management in Sydney — the division of responsibility between local and State Government.

4.2 Waste Management Prior to Municipal Governance

For the first 44 years of Sydney's existence, there was no provision of government services such as water supply, sewerage, night soil and garbage removal or street cleaning (Larcombe, 1961:3,4). Governor Macquarie took over

the administration of the Colony of New South Wales in 1810 and introduced Government Orders which sought the cooperation and voluntary assistance of the citizenry in matters of civic maintenance (Maiden, 1966:17). For example, the Government Order of 27 February 1813 informed the householders of 'Pitt, York, Castlereagh, and other principal streets' that they 'were individually enjoined to keep the water-course opposite of their respective houses, at all times, free of dirt and rubbish of any kind, so that in time of heavy rains the water may have a free course to pass through' (Maiden, 1966:17). This particular Order was given persuasive force by the threat to impose a tax on householders to defray the cost of the government carrying out the maintenance tasks neglected by them. While the system of Government Orders may have encouraged the removal of some household waste to the outskirts of the settlement, the newspaper reports of the 1830s about the squalor of Sydney streets (Larcombe, 1961:3) leave little doubt that much household waste was deposited close to its point of generation.

While Governor Bourke noted in a Governor's Minute issued not long after he arrived in Sydney in 1832 that there was a need for some form of municipal governance, the idea appears not to have been acted upon (Larcombe, 1961:4). The first statutory institutions for local government were the Police Acts of 1833 and 1838, which gave to police magistrates appointed by the Governor many of the powers that would later become the province of local government (Maiden, 1966:33). These included the power to prevent pollution of watercourses and require the cleansing of butcher shops and slaughter houses.

4.3 The Emergence of Local Government Responsibility

In 1840, Governor Gipps introduced the Municipal Corporations Bill into the Legislative Council in response to increasing demands on the Government for provision of services (Larcombe, 1961:12). The Bill allowed for the incorporation of boroughs with elected councils which would be empowered to levy rates to finance the provision of routine municipal functions such as road construction and maintenance, water supplies, sewerage. Although the Bill was rejected by the Legislative Council at its first introduction, it was re-introduced and passed as the Sydney Corporation Bill in 1842, providing only for the incorporation of Sydney. The functions of the Corporation included routine functions such as street cleaning, cleansing and maintenance and water supply, although it appears that the Corporation devoted little or no resources to

sanitary services such as garbage and night soil removal (Larcombe, 1961:16, 57).

The Sydney City Corporation, as the first municipal bureaucracy in Australia, suffered from a lack of personnel with relevant training, unwieldy administrative procedures and insufficient financial resources (Maiden, 1966: 191,192). In response to growing criticism, the Legislative Council appointed Select Committees in 1849 and 1852 to inquire into the workings of the Corporation. These Committees did not report favourably, and the Government dissolved the Corporation in 1853, replacing it with three Commissioners. Later in 1853, the Sydney Sewerage Act and the Sydney Water Supply Act were passed, authorising Government borrowings to fund the construction of sewerage and water supply infrastructure under the control of the Commissioners (Maiden, 1966: 197,198).

However, the Commission, while making substantial albeit expensive progress in the provision of infrastructure, suffered a similar fate to the Corporation. After a further three Select Committees, the Sydney Corporation Re-establishment Act 1857 replaced the Commission with a Corporation and Council with the power to borrow substantial sums for general, water and sewerage works (Maiden, 1966: 200).

The Municipalities Act 1858 made it possible for municipal governance to be established outside the boundaries of the Sydney City Council and by 1860, eight municipalities had been incorporated in the Sydney region: Randwick, Waverly, Glebe, Redfern, Balmain, Paddington, Woollahra and Waterloo (Maiden, 1966:70-72). Under the Act, Councils were able to make by-laws relating to, among other things, the prevention of nuisances and the preservation of public health (Larcombe, 1961:40). The Municipalities Act 1867 aimed to correct some of the administrative difficulties experienced by municipalities under the 1858 Act, and conferred additional powers and functions, including those previously the domain of police magistrates under the Country Towns Police Act and nuisance abatement (Maiden, 1966:85). However, a Select Committee in 1874 found that the majority of boroughs and municipalities had not established sanitary services due to a lack of funds (Maiden, 1966:98).

4.4 Local Government Failures and State Responsibilities

While most of the Sydney region was under some system of municipal governance throughout the latter half of the 19th century, the available evidence seems to suggest that the management of municipal waste was insufficient to prevent it being a risk to public health. The first City Health Officer was appointed in 1857, and some municipalities appointed Inspectors of Nuisances. These moves, however, had little impact on public health, due to the lack of qualified personnel, the lack of necessary powers for councils to rebuild slum areas and the tendency for economic interests to over-ride public health concerns (Larcombe, 1961:57,58; Fitzgerald, 1987:80). The dissatisfaction with the performance of local government that surfaced periodically in the latter half of the 19th century resulted in the return of a number of functions to the State Government. These included the construction and maintenance of principal roads (the Main Roads Act 1858), control and licensing of public vehicles (Metropolitan Transit Commission formed in 1873) and the Metropolitan Water and Sewerage Board (Water Supply and Sewerage Act 1880) (Maiden, 1966:68, 202, 203).

An outbreak of smallpox led to the Infectious Diseases Supervision Act of 1881 which established the Board of Health. With the increasing industrialisation of Sydney in the late 19th century and the growing number of tanneries and boiling-down works, this advisory body soon became involved in the abatement of nuisances. The Noxious Trades and Cattle Slaughtering Act of 1894 was essentially a transfer to Australia of the traditional British nuisance laws and empowered the Board of Health to advise the Government on the regulation of these industries (Coward, 1976:15). The powers of the Board were further expanded with the passing of the Public Health Act in 1896, which enabled it to make regulations without the intervention of a Minister. The Act also was responsible for the establishment of the Department of Public Health and the Health Inspection Branch whose Sanitary Inspectors were responsible for policing the sanitary functions of local government, including the collection and disposal of garbage (Coward, 1976:16).

By 1905, there were 192 municipalities in New South Wales, covering 0.9 per cent of the land area. So that the New South Wales Government could divest itself of the responsibility of providing basic local services to the remaining 99.1 per cent of the State, the Government (Shires) Extension Bill was passed in 1905 to provide for the incorporation of this area. The functions of shires under this

Bill included the provision of sanitary, and garbage and refuse services (Larcombe, 1961:52).

The Government (Shires) Extension Bill was followed by the Local Government Extension Act in 1906, and upon its passage, the two were consolidated as the Local Government Act 1906. This Act placed local government in New South Wales on a more secure financial footing. Compared to the changes in the late 19th century, the institutional arrangements established by the Act underwent only minor changes for much of the 20th century. In 1919, the 1906 Act was repealed and replaced by the Local Government Act of 1919 to bring a number of measures that had been introduced in other Acts within one piece of legislation. Reflecting a broadening in their powers, sanitary inspectors were renamed as health inspectors (Larcombe, 1961:65). The 1919 Act also provided the means for the constitution of county councils where services could be provided more efficiently across a group of local government areas. Only eleven county councils had been formed by 1944, but this number increased to 56 at the end of 1962, with most county councils being responsible for the supply of electricity, and fewer numbers involved in the supply of water or gas, the control of noxious weeds and the operation of abattoirs (Maiden, 1966:260-268)

4.5 Early Centralisation and Regionalisation Proposals

The idea of a central authority responsible for Sydney's waste disposal was put forward in the Legislative Assembly as early as 1932, when the Minister for Local Government, in referring to the Greater Sydney Bill that was before the House noted that:

> *In my view the disposal of garbage by metropolitan municipalities is a matter upon which complete control should be exercised by one authority. That authority should be the central governing authority of the metropolis. To ensure the better management of our metropolis, a new group of aldermen must be elected at no distant date. They will be men well fitted to control our beaches, and to see that those beaches are not polluted by garbage which has been cast upon them by the sea. It will the duty of those men to ensure the development of our beaches in a way that will command the respect and admiration of the whole State.*
>
> (Legislative Assembly, 13.10.32:1074-1075)

Regionalised responsibility for waste management was under consideration as early as 1958. As a result of the July 1958 meeting over the closure of the St Peters tip (see appendix B7.4.2), officers of the Cumberland County Council had been asked to conduct a survey of sites suitable for landfill in the metropolitan region. In July 1959 in a meeting of the Cumberland County Council, the Chief County Planner reported that a total of 130 sites suitable for landfill had been located and these sites provided sufficient capacity to dispose of Sydney's garbage for a further 35 years.

It was also recommended by the Chief County Planner that councils in the metropolitan area form groups to manage the operation of landfills, as the 'system of disposal of garbage by individual Councils is no longer practicable in Sydney and is preventing many Councils from adopting satisfactory, economical methods of disposal' (cited in Legislative Assembly, 8.3.66:3919). This appears to have been the first proposal for regionalisation of waste management across the whole of the Sydney metropolitan area. As mentioned in appendix B8.3.1:3, representatives of three Eastern Suburbs councils approached the Minister for Local Government in February 1960 with a view to forming a county council to build and operate an incinerator to serve the three councils (SMH, 2.2.60:8). The request was refused (SMH, 16.9.60:19), no doubt because of the Department's policy favouring cheaper landfill methods of waste disposal. Nevertheless, the proposal was put forward again in 1965 (MWDA, 1981:3) as the Eastern Suburbs councils regarded incineration as the 'inevitable' solution to waste disposal in this area (SMH, 16.5.64:8). In 1961, the North Sydney City Council approached other councils on the north side of the Harbour as to their views on forming a county council to operate an incinerator, and found that these councils were less than enthusiastic about the proposal (SMH, 5.4.61:4).

In April 1965, the Canterbury Council convened a conference on waste disposal that resulted in the formation of the Western Suburbs Councils Refuse Disposal Committee (Legislative Assembly, 8.3.66:3930; MWDA, 1981:3; Butlin, 1976:247). Also in 1965, the Local Government Association, after its annual conference, asked the Minister for Local Government in the new Askin Government to appoint a committee to investigate Sydney's waste disposal problems. The Minister replied that the responsibility for garbage collection and disposal had always been the responsibility of local government, and that therefore the best approach would be for the councils to take joint action themselves (Hunt, 1968:2).

There is some evidence that the view of the Minister for Local Government was not shared by all members of the Government. In March 1966, a Government member in the Legislative Assembly, Mr Ruddock, moved:

> *That, in the opinion of this House, the Government be requested to set up an appropriate authority to investigate and report upon the following:*
>
> *(a) Garbage disposal methods in the Sydney metropolitan area and other densely populated areas.*
>
> *(b) The serious shortage of tipping dumps.*
>
> *(c) Alternative proposals involving incineration and/or conversion of garbage into compost and fertilizer.*
>
> *(d) Plant and equipment being successfully operated and used in other parts of the world.*
>
> (Legislative Assembly, 8.3.66:3918)

The Minister for Local Government made only several single sentence interjections throughout the debate on the motion, and the Opposition used the existence of the Western Suburbs Councils Refuse Disposal Committee as an argument against the motion (Legislative Assembly, 8.3.66:3930).

As a consequence of the refusal of the Minister for Local Government to set up a committee, the Metropolitan Mayors and Presidents resolved at a meeting in November 1966 that all councils in the County of Cumberland contribute $200 each to finance an expert investigation by the Local Government Association into the garbage collection and disposal problems in the County (Hunt, 1968:2). Some councils refused to make the contribution. For example, the North Sydney Council suggested as an alternative that a county council be formed to handle garbage disposal for the metropolitan region (SMH, 18.1.67:6). Woollahra Council refused because of its proposal to build an incinerator and the Windsor Council maintained it was too remote from the metropolis (SMH, 3.2.76:7).

Regionalisation was also canvassed in a number of papers presented at the First Australian Refuse Disposal Conference, held at the University of New South Wales in August 1967 (Kirov and Toner, 1967; Parkinson, 1967; MWDA, 1981:3). At this conference, the Minister for Local Government re-affirmed the Department's view that incinerators should not be built in residential areas while ever the cheaper alternative of landfill was available, venturing that

perhaps cheap nuclear power would be used in the future to incinerate garbage. Notably, the Minister's view was contrary to that put forward by Professor Kirov of the Department of Fuel Technology at the University of New South Wales and by the Chief Municipal Health Surveyor with Waverly Council, H.K. Toner (SMH, 23.8.67:3).

In September 1967, seven councils on the north side of the Harbour discussed the possibility of forming a group to operate an incinerator. Several of the councils had recently had problems with strong resident protests about the impacts of tips (see appendix B7.4.5-6) and were facing strict Health Department supervision of extensions to existing tips. The councils had also been lead to believe that the Health Department favoured the use of incinerators rather than landfill (SMH, 19.9.67:16). As mentioned in section 8.4, the idea of regionalisation using a number of incinerators was put forward in a lengthy article in the *Sydney Morning Herald* in January 1968 (SMH, 24.1.68:2).

The expert investigation into Sydney's waste disposal problems by the Local Government Association was completed in early 1968 and the Association then referred the report to P.A. Management Consultants for their assessment. In June 1968, the Local Government Association discussed the recommendations of P.A. Management Consultants with the Minister for Local Government and a decision was made to have W.D. Scott and Co carry out a preliminary survey to assess what might be needed to set up regionalised waste management operations across the whole metropolitan area (Hunt, 1968:3). Neither the P.A. Management Consultants or the W.D. Scott reports gave any consideration to waste reduction or recycling, although both recommended that an overall waste management plan for the Sydney region was required (Butlin, 1976:247). In September 1968, a Special Conference of Metropolitan Councils resolved that a decision on the Scott report should be deferred while individual councils, and particularly those already involved in regionalisation proposals, were given the opportunity to put forward their views.

At least one council put forward dissenting views. The Municipal Health Surveyor of Bankstown Council, H.C. Hunt, argued for the establishment of a Commonwealth research organisation, similar to the Commonwealth Experimental Building Station, that would provide technological solutions to the problems facing local government (Hunt, 1968). Hunt's report also makes quite clear that regionalisation posed a threat to councils such as Bankstown

Council, that had made considerable investment in setting up facilities to take industrial and municipal waste from other parts of the Sydney region.

In November 1969, the mayors and shire presidents met again in a special conference to consider the Scott report (SMH, 15.11.69:13). The report estimated that it would cost $64 000 for a full study. The Minister for Local Government offered to pay half this cost if the councils would meet the other half (Legislative Assembly, 25.11.70:8395). The conference resolved that the mayors and shire presidents would place before their respective councils a recommendation that a major study into the garbage problem be approved at a cost of $1000 per council (SMH, 15.11.69:13).

However, before all the councils could agree to funding the study, the closure of local government tips to liquid industrial waste in December 1969 resulted in an approach to the Department of Decentralisation and Development by the liquid waste transport and disposal industry, the State Development Co-ordinating Committee was convened to examine the matter, and the State Government brought in an overseas expert to review the question of waste disposal in Sydney. Soon after, as described in detail in section 4.7, the Waste Disposal Act, 1970 was passed.

4.6 The Environmental Acts of the 1960s and 1970

The late 1960s and early 1970s in NSW saw substantial changes in the legislation relating to environmental matters. The Waste Disposal Act of 1970 was one of three Acts introduced by the Liberal-Country Party Government, the others being the Clean Waters Act 1970 and the State Pollution Control Commission Act 1970. While the events that led to the perception of the need for a centralised agency to manage wastes are largely waste-related, the form that the Waste Disposal Act took was influenced by both its legislative precedents and the increasing political attention to environmental matters in Sydney in the 1960s.

4.6.1 Increasing Environmental Awareness

By the time of the publication of Rachel Carson's *Silent Spring* in 1962, regarded by some as signalling the beginning of modern environmentalism (see, for example, Colborn, Dumanoski and Myers, 1996:15, 51; Dryzek and Schlosberg, 1998) the following elements of modern environmental discourse had already appeared in the pages of the *Sydney Morning Herald* in the period from 1930 (appendix B4.1:1-2):

- nature as being essential for the physical and spiritual well being of humans,
- municipal waste as a polluter or desecrator of nature,
- the wastefulness of consigning to tips materials that could be re-used,
- the idea of recycling organic waste into something that could restore the health of the soil,
- the desirability of conserving soil and water resources,
- the possibility of dangerous chemicals in the environment,
- hidden health dangers associated with affluence generally and plastics specifically

In addition, the practicality of retrieving materials from the waste stream for re-use had been demonstrated with the Canterbury Council's composting plant.

Rachel Carson's work was first mentioned in the *Herald* in 1962 (SMH, 27.11.62:2) in an editorial which also referred to the serious concerns expressed by the Duke of Edinburgh in a recent address to the Australian Academy of Science. However, the idea of pesticides as danger to the environment and human health that insidiously circulated in the environment did not appear on the pages of the *Herald* until a series of letters to the editor in early 1968. These letters about the dangers of insecticides contain many additional elements of modern environmental discourse:

- the questioning of local expert knowledge (SMH, 30.1.68:2; 7.2.68:2),
- appeal to the claimed superior knowledge of overseas experts (SMH, 30.1.68:2),
- appeal to overseas studies (SMH, 5.2.68:2),
- the role of human fallibility (SMH, 30.1.68:2),
- concern about long term effects (SMH, 30.1.68:2; 7.2.68:2),
- bio-magnification of toxic substances in food chains (SMH, 5.2.68:2),
- humans not exempt from the laws of nature (SMH, 5.2.68:2),
- the difficulty of unequivocal demonstration of cause and effect (SMH, 30.1.68:2), and
- simple environmental monitoring by members of the public (SMH, 7.2.68:2).

By 1968, the science of ecology had been put forward in the pages of the *Herald* as the branch of science most relevant to solving pollution problems, and ecological arguments had been advanced in the protests against several landfill proposals (appendix B4.1:4). By mid-1970, immediately prior to the introduction of two environmental Bills and the Waste Disposal Bill into the Legislative Assembly, there had also been published in the *Herald* a series of prominent articles on industrial pollution, coverage of the first Earth Day in the USA and an article about 'spaceship earth' (appendix B4.1:5).

The *Herald* reported in March 1970, 'Since the N.S.W. legislation was introduced, public feeling against pollution has risen sharply' (SMH, 19.3.70:10). The *Herald* also recorded in an article on New South Wales' first Earth Week in September 1972 that:

> *The Herald's cutting files on pollution expanded dramatically at the end of 1969. While several years of pollution articles filled each folder until then, a single folder was needed to contain the articles written during only the first six months of 1970.*
>
> (SMH, 18.9.72:20)

In this period, there is little doubt that NSW politicians began to become more aware of the apocalyptic dimension of environmentalism. In February 1970, a member of the Opposition asked in a question without notice to the Minister for Health:

> *In the interval since this House last met has the Government become aware of massively heightened public concern regarding the effects of industrial mega-city have upon both physical and mental health? Is this concern allied with apprehension felt regarding the harmful impact upon the quality of life generally flowing from pollution of the whole environment — earth, air, river and sea?*
>
> (Legislative Assembly, 17.2.70:3277)

In responding at a later date to a part of the question he was unable to answer, the Minister for Health agreed:

> *It is true that heightened public concern regarding the effects of pollution on the quality of life is apparent, and the Government is taking initiatives to safeguard the health of the community.*
>
> (Legislative Assembly, 17.3.70:4298)

What was even more dismaying for Cabinet, according to the *Herald*, was that a study by the Health Department had shown that:

> *...any attempts to eliminate pollution overnight would cause a huge industrial dislocation. The evidence, collected mainly by Health Department experts indicates that heavy industry has so developed on the basis of massive discharge of industrial waste into the waterways that it could take decades to adjust to a total prohibition.*
>
> (SMH, 19.3.70:10)

There is also little doubt that there was more to the growing awareness of the environment reflected in the pages of the *Sydney Morning Herald* than simply greater attention being paid to an unchanging amount of pollution that had always been present. The number of factories in Sydney doubled between 1950-51 and 1965-66 and the air and water pollution from these factories was increasingly being mentioned in the annual reports of the Department of Public Health from the 1950s onwards, including the fact that the Department was having difficulty dealing with the growth in complaints about pollution

(appendix B4.2:1-3). A fledgling private sector pollution control and waste management industry was promoting its technologies to both local and State government by 1970 (appendix B4.3:1).

4.6.2 The Clean Air Act 1961

The Clean Air Act 1961 had its origins in the formation by the NSW Government of the Smoke Abatement Committee in response to increasing concerns about the levels of air pollution, particularly from the power stations in inner Sydney, and complaints by industry about ambiguity of existing legislation (appendix B4.4:2). There were also complaints from the clay brick industry that it had been over-zealously pursued by local government exercising its powers under the Smoke Nuisance Abatement Act of 1902, so that this industry viewed favourably legislation that would replace this Act (appendix B4.4:11). It is worth noting that the Smoke Abatement Committee dismissed as ineffective existing legislation such as the Smoke Nuisance Abatement Act (appendix B4.4:11).

The Clean Air Act established an Air Pollution Control Branch within the Department of Public Health and an Air Pollution Advisory Committee, the role of the latter being to advise the minister on emission standards and the granting of licences to scheduled premises (appendix B4.4:6). The establishment of a central authority with responsibility for air pollution control was recommended by the Smoke Abatement Committee, and the legislature was aware that this model was in use in the UK and USA, the latter having been visited by the Minister for Public Health in the course of drafting the Bill (appendix B4.4:3). It is quite clear from the Government's position in the debate on the Clean Air Bill in the Legislative Assembly that it intended to take a cooperative approach with industry (appendix B4.4:7-10). The extensive industry representation on the Committee, while it may have been intended as a means of obtaining the cooperation of industry, may have also functioned to protect the interests of industry (appendix B4.4:6).

4.6.3 The Water Pollution Bill 1969

Eight months after the election of the Coalition Government (i.e. the coalition between the National Party, a conservative party representing rural interests, and the Liberal Party, a conservative party representing urban business interests — all usage of this term refers to this particular coalition of conservative parties) in May 1965, the Minister for Health, Mr Harry Jago, visited New Zealand to, among other things, examine how water pollution was being approached with the legislation that had already been passed in the 1950s in that country. In June 1966, Cabinet gave in principle approval for 'the preparation of a bill on the lines of the Water Pollution Act of New Zealand' (Legislative Assembly, 4.3.69:4140). Approval was also given for the Department of Public Health to confer with other agencies in preparing the legislation.

It was almost another three years before the Water Pollution Bill was introduced into the Legislative Assembly on 27 March 1969. During this period, a number of aspects relating to the effectiveness of pollution legislation had been raised in the Legislative Assembly. These included:

- the difficulties in obtaining speedy abatement of pollution problems caused by poorly operated council tips, due to the lack of power on the part of the Department on Local Government, the focus on health rather than environmental impacts by the Department of Health and the transient nature of the events giving rise to these impacts (appendix B4.5:2-3),

- the idea that ineffective control of pollution was due to fragmentation of responsibility (appendix B4.5:4),

- the possibility of agency capture (appendix B4.5:5),

- the need for pollution control measures to be able to be updated as new forms of pollution occurred (appendix B4.5:5),

- if the sole function of penalties is to alter the structure of costs faced by industries in favour of investment in pollution control equipment, then

penalties for non-compliance need to be of a similar magnitude or greater than the costs of compliance (appendix B4.5:5),

- prosecution of offenders could be very costly in time and money because of the opportunities for legal obfuscation afforded by scientific uncertainty (appendix B4.5:8),

- where governments themselves are polluters, the pace of compliance by industry may be limited by the pace of compliance of government (appendix B4.5:9),

- attractive as the proposition might be that implementation of pollution control legislation requires only technical decisions, it is inherently political (appendix B4.5:10), and

- pollution control is a difficult arena of public administration (appendix B4.5:11).

In addition, relatively few directions or prosecutions were made by the Air Pollution Control Branch during this period, although the Clean Air Advisory Committee reported that considerable sums had been spent by industry on air pollution control equipment (appendix B4.5:12-13).

The Bill bore many similarities to the Clean Air Act. The route by which action was to be taken against polluters was via recommendations by a Water Pollution Advisory Committee to the Minister for Health. This ensured that political considerations could be brought into pollution control directives (appendix B4.5:15). Licences would be required by premises discharging effluents into streams, which would be classified according to the effluents they could receive — a system that the Government knew from the New Zealand experience was very slow to implement (appendix B4.5:16). The Government proposed to take the same cooperative approach with industry (appendix B4.5:17).

During the first and second reading debates, it was quite clear that members from both sides of politics were aware of the shortcomings of the Clean Air Act, including its ineffectiveness against pollution by Government instrumentalities, and the Advisory Committee's 'lack of teeth' (appendix B4.5:18).

4.6.4 The Clean Waters Act 1970

The Clean Waters Bill was introduced into the Legislative Assembly on 27 October 1970, a period of eighteen months after the second reading debate on the Water Pollution Bill, during which the Government had received submissions on the Bill — an approach that had also been followed with the Air Pollution Bill (appendix B4.4:5).

A number of changes were made to procedural and administrative aspects of the Bill (appendix B4.6:4), the change that probably most clearly reflected the growing political awareness of the strength of public opinion on the environment being the fivefold increase in the maximum penalties for water pollution offences. The Government, in proposing an appeals board to handle appeals against decisions made under the legislation, rather than a court, made a strong case that the appeals process would be would be unduly lengthy in a court due both to legal obfuscation and uncertainties raised by technical experts (appendix B4.6:7-8).

The idea that pollution problems had been caused by fragmented responsibility was repeatedly mentioned in debate as a justification for the formation of the Clean Waters Advisory Committee as a central authority. The idea of a central authority formed a persistent thread in the debates in the Legislative Assembly during the passage of the Bill, although the precise definition of what constituted a central authority was not clearly articulated. Generally, the Government argued that the Clean Waters Advisory Committee would provide such centralisation, while the Opposition argued for a statutory authority which would not have the degree of industry influence that the Committee had (appendix B4.6:9-11). The Government, however, argued that action was urgently required and that a statutory authority would take longer to establish (appendix B4.6:1).

The debate on the Clean Waters Bill introduced new perspectives and policy considerations that had not been present in the debate on the Clean Air Bill. Firstly, the justification for the Act was related as much to environmental quality as to public health. References to the state of the environment involved concepts from ecology or popularised forms of it that were absent from even

the debate on the Water Pollution Bill some eighteen months previously. These included 'ecological balance', 'it is necessary to have regard to the whole water system', 'the natural habitat', 'marine breeding ground', 'the earth's water resources', 'eutrophication' and 'complex life environment' (Legislative Assembly, 4.11.70:7379; 5.11.70:7433; 10.11.70:7519,7526, 7529,7533,7534, respectively).

The debate also included expressions from environmentalist discourse and the industry response to environmentalist critiques: 'protect the environment for the next generation' 'it is people who pollute, not organisations' 'what is nowadays a fashionable idea that there is something wrong with economic growth', 'finite earth', 'eco-catastrophe' and 'irrevocable pollution of our waterways' (Legislative Assembly, 5.11.70:7420, 7428, 7433; 10.11.70:7527,7530; 11.11.70:7640 respectively).

Environmental and other social movements, and public meetings protesting about environmental concerns were mentioned for the first time in the debates on the Clean Waters Bill (Legislative Assembly 5.11.70:7421,7429,7431), as were a number of environmental policy issues such as monopolies on technical expertise by government departments and capital flight between States in response to differing standards of pollution regulation (Legislative Assembly 5.11.70:7430; 4.11.70:7377, respectively).

4.6.5 The 1969 Industrial Waste 'Crisis'

The second and third environmental bills passed in late 1970s, the State Pollution Control Commission Act and the Waste Disposal Act, had a shared origin in the problem of industrial waste disposal in the late 1960s. As discussed in section B4.2:1, there was substantial growth of secondary industry in the Sydney region in the post-war period, and this resulted in an increasing amount of industrial waste and increasing complaints to the Department of Health about the effects of existing disposal practices.

The disposal methods used by industry in the late 1960s were listed in the Barton Report as:

(1) *Arrange with the Metropolitan Water Sewerage and Drainage Board for it to be put into the public sewer after satisfying the Board that the effluent is of a suitable standard to be accepted, and agree to maintain that standard.*

(2) *To work with the Maritime Services Board and install such plant as will provide and maintain a suitable effluent for discharge into waters under the control of the Board.*

(3) *Try to reclaim some of the material of value before regarding it as waste, and later either burn, or lagoon the liquid, at some point removing as much water as possible, leaving the remainder to dry out or percolate through the ground.*

(4) *Let the liquid go down the nearest drain in the factory and forget about it in the hope that nobody can trace it.*

(5) *To engage the services of a contractor to remove the liquid, ask no questions, but just pay the bill.*

(6) *Some industrial wastes may be taken out to sea and dumped at a considerable distance from the shore.*

(Barton, 1970:9)

Given the increasing efforts of the Department of Public Health in the 1960s to trace pollution sources, the fourth form of disposal listed above may have become a less viable option. Given also that the first, second, third and sixth options above would have required greater effort and/or expenditure on the part of factory owners and managers, than would the fifth option, it is perhaps not surprising that, as Barton (1970:9) recorded, the waste transport and disposal industry grew substantially in the 1960s. This industry was comprised of a relatively small number of recognised firms and a larger number of small contractors and tanker-truck owner/drivers. Barton (1970:10) estimated that the waste industry removed at least 300 000 gallons of industrial waste per week from factories in the Sydney region.

The waste industry operators disposed of the liquid waste it collected in four ways:

- into pits or lagoon on land owned or leased by the operators,
- into tips operated by local government,

- into the MWSDB sewers with the permission and oversight of the MWSDB, and

- illegally into bushland, waterways and sewers.

From his discussions with waste transport and disposal firms, Barton found that relatively few owned disposal sites and many had been dependent on local government tips. As the volume of liquid industrial waste increased during the 1960s and tips became saturated, they were closed to the receival of liquid waste, with the last tip being closed to receival of liquid waste in December 1969 (Barton, 1970:10). According to Barton's accounting of the amounts of liquid industrial waste being disposed of legally, and a report in the *Herald*, the tip closure resulted in some 200 000 gallons of liquid industrial waste being disposed of illegally each week into bushland, waterways and sewers (Barton, 1970:12-14; SMH, 17.4.70:4).

Barton reported that the decision by local councils to close their tips to liquid waste was in response to 'advice' by the Department of Public Health and to local complaints. This was referred to by the Minister for Decentralisation and Development, J.B.M. Fuller in the Legislative Council in February 1970 as a refusal by the Department of Health to allow liquid industrial waste to be mixed with municipal waste (Legislative Council, 19.2.70:3399). The Annual Report of the Department for 1968 reported that disposal of industrial wastes had become a 'rapidly increasing problem' with some privately operated tips being a 'serious hazard' and suitable sites for the disposal of liquid waste 'very difficult to obtain' (Dept Public Health, 1970:50). The Annual Report for 1969 suggests that the issue of liquid waste disposal 'came under greater scrutiny' in 1969 due to:

> *... the asphyxiation of driver of a liquid waste tanker; the exploding of a tanker vehicle, and the closure of most Council Garbage Depots to liquid waste and sludge removal contractors.*
>
> (Dept Public Health, 1971:51)

Pausacker (1978:99, 101) noted similar problems with closure of local government tips to liquid industrial waste in the late 1960s and early 1970s in Melbourne. He attributed local governments' reluctance to accept liquid industrial waste to several reasons, including their concerns about pollution of

groundwater, their wish to avoid local amenity impacts that would bring protests from residents and their desire to conserve the landfill space that they had available to them.

The closure of local government tips to liquid industrial waste appears not to have been sufficiently newsworthy to warrant mention on the pages of the *Herald* in 1969. It was first mentioned in April 1970, in the fifth of a series of articles on pollution in Sydney (SMH 17.4.70:4), by which time as much as 200,000 gallons per week of liquid industrial waste was being dumped illegally into waterways, sewers and reserves.

While the closure of local government tips to liquid industrial waste may not have been of public concern in 1969, several of the waste industry firms were sufficiently concerned about their future in the absence of disposal sites to make an approach to the Department of Decentralisation and Development. To understand why these firms would have approached this Department, it is necessary to be aware of the history and role of this Department. One of the initiatives of the incoming Liberal — Country Party government in 1965 was to create a new portfolio of Decentralisation and Development as the sole responsibility of a Minister, in the place of the Department of Industrial Development which had been the responsibility of the Premier and Treasurer. While the justification for decentralisation policies may have been initially to 'check and reverse the movement of the population away from country areas through substantially increased regional secondary industry establishment' (Fuller, 1965:1), by the late 1960s and early 1970s the rationale for decentralisation was in terms of 'the best means of controlling the excessive population growth of the State's metropolitan areas' (Anon, 1969:2) and:

> *Whatever it may have been in the past, decentralisation today is not just a country problem. Increasingly, it is a metropolitan problem.*
>
> *Increasingly the motivation for decentralisation is all around us, manifested in our daily lives — in our working lives and in our private lives, slowly eroding many of the benefits once accepted as attaching to life in a big city.*
>
> (Anon, 1971:2)

Decentralisation as a means of reducing the environmental impacts of Sydney's growth was also alluded to by the Minister for Health in a speech on the Loan Estimates in the Legislative Assembly.

> *The procedure adopted by the Government is undoubtedly correct; it is subsidizing industry to settle in country areas. Every thousand people kept from coming to Sydney but diverted to country locations, means fewer expressways have to be built in expensive urban areas. It means that we are saved from having to provide more services, the cost of which is astronomical and much higher for similar services in a non-metropolitan area.*
>
> *Sydney is still a beautiful city but our beaches, once our pride, are becoming dirty and smelly. At Christmas time I took my family to one of our most beautiful beaches but I most certainly shall not go there again. All this is inevitable if a city is allowed to grow too big.*
>
> (Legislative Assembly, 21.10.70:6826)

The Department of Decentralisation and Development provided a number of services to industry, including assistance in locating land outside the metropolis and long term low-interest loans for land purchase (Dept Decentralisation and Development, 1978). The Minister for Decentralisation and Development referred to the close relationship between his department and industry during the debate on the Waste Disposal Act:

> *My department has had a great deal of contact with industries in the metropolitan area, and is aware of their problems in this regard* [liquid waste disposal].
>
> (Legislative Council, 25.11.70:8346)

Indeed, it appears that Fuller continued for some years to see the liquid waste problem as an impediment to industry rather than an environmental problem:

> *I have a particular interest in it* [the liquid waste survey carried out by the MWDA in 1973] *because industry is having considerable difficulty in disposing of liquid waste.*
>
> (Legislative Assembly, 9.8.73:38)

According to the *Herald* in April 1970 and the account given by the Minister for Decentralisation and Development in his second reading speech on the State Pollution Control Commission Bill in November 1970, the larger waste

transport and disposal firms were experiencing difficulty in late 1969 in obtaining land they could use as liquid waste disposal sites and believed they should be given an area of land for the purpose by the State Government (SMH, 17.4.70:4; Legislative Council, 25.11.70:8315). A number of the waste transport and disposal firms then approached the Department of Decentralisation and Development for assistance.

The following account of the response of the Department and subsequent events is drawn mainly from the second reading speech of the Minister for Decentralisation and Development mentioned above (Legislative Council, 25.11.70:8314-8316). Consultations by the Department with local government and the Department of Public Health revealed 'an acute industry problem'. The State Development Co-ordinating Committee was convened to examine the problem. The Committee consulted with a number of industries with liquid waste disposal problems and estimated that there was approximately 300,000 gallons per week of liquid waste 'requiring ground disposal'. Over a period of several months the Committee developed a 'close liaison' with the MWSDB, the Maritime Services Board, the Department of Public Health, the State Planning Authority and the Department of Decentralisation and Development. A sub-committee of Ministers — the Minister for Local Government and Highways, the Minister for Public Works, the Minister for Health and the Minister for Decentralisation and Development — was formed early in 1970 to 'go into this matter very closely with a view to finding the best possible short and long-term solutions to the problems in the interests of the community generally'. The sub-committee of Ministers appointed a steering committee comprising the Deputy Director of the Department of Decentralisation and Development, the President of the MWSDB, and the Under-Secretaries of the Departments of Health and of Local Government. The steering committee was supported in its work by senior officers of the departments mentioned above, who liaised with the Local Government Association, councils and the waste industry. According to the *Herald*, one solution to the liquid waste disposal problem that was attempted was a request from the Minister for Local Government to local government for it to allow the waste to be spread across all 40 council tips that were operating in the Sydney region. This request was refused (SMH, 17.4.70:4).

According to an account given by the Deputy Premier of New South Wales, Sir Charles Cutler, some four years later, the Minister for Local Government and the under secretary of the Department visited a number of waste treatment installations overseas in late 1969 and had discussions with the authorities that were operating them. These discussions, together with discussions with the Local Government Association:

> *... all pointed to the need for the establishment of a co-ordinating and controlling body that would be able to initiate measures in the short term to relieve the critical liquid waste disposal problem, while undertaking a comprehensive study of the most satisfactory method of treating this waste in the future.*
>
> (Legislative Assembly, 24.9.74:1323)

The sub-committee of ministers recommended that Mr Alan Barton, an expert on solid and hazardous waste disposal in the United Kingdom 'report on all aspects of waste and garbage disposal, with particular reference to the problems of industry'. As a temporary measure, the MWSDB increased the amount of liquid industrial wastes it was accepting into the sewerage system by taking waste greases and fats at the Fairfield and St Mary's sewerage treatment works where there was some excess capacity, and discharging other untreated wastes at the Malabar sewerage outfall (Legislative Assembly, 24.11.70:8258; SMH, 14.4.70:8). This latter proposal was protested against strongly by Randwick Council (SMH, 22.4.70:4). The sub-committee also reviewed existing legislation aimed at reducing pollution and recommended that 'a State pollution control commission should be set up as the main feature of a co-ordinated and vigorous attack on pollution in all its forms'.

4.6.6 The State Pollution Control Commission Act 1970

Before the Clean Waters Bill had passed through both Houses of the New South Wales Parliament, the State Pollution Control Commission (SPCC) Bill was introduced into the Legislative Assembly on 19 November 1970 by Premier Askin. While the debate on the Clean Waters Bill leaves little doubt that water pollution was seen as a serious and increasing problem, the debate on the SPCC Bill suggests that parliamentarians on both sides were feeling beleaguered by

increasing ubiquity and complexity of the environmental problems that were being revealed in 1970 (appendix B4.7:1-7).

The SPCC was to be a supervisory, coordinating, monitoring and research instrumentality, with the power set environmental standards and direct local government and State Government departments to carry out their statutory powers. It was to comprise twelve commissioners, of whom seven were to represent various government departments and five to represent industry and conservation interests. The Commission was to be supported by a Technical Advisory Committee, the majority of whose members were to be drawn from government departments (appendix B4.7:8-11).

The Government went to great lengths to demonstrate in both houses of the legislature that, despite the division of responsibility between the Department of Health and the Commission, the arrangements still represented the centralisation of authority that both sides of politics argued was required to deal with such a serious problem (appendix B4.7:12-16 and figure B4.2). However, the Opposition was obviously not convinced by the Government's assurances, and much of the debate over the SPCC Bill was structured, as with the previous Clean Waters and Water Pollution Bills, round generalisations about centralisation and fragmentation of authority (appendix B4.7:17).

Another difference from the debates on the Clean Air Bill and the Clean Waters Bill, was the absence of argument about the effectiveness of approaches that sought the co-operation of industry. While it was specifically mentioned by the Minister for Public Works that the SPCC would have the power to direct industry (Legislative Assembly, 24.11.70:8270), just how this would occur was not detailed and there was no debate as to whether industry should be approached co-operatively or punitively.

Finally, it is worth noting that, while the debate on the Clean Waters Bill included for the first time mention of environmental groups and public protest meeting, it was in the debate on the SPCC Bill that the phenomenon now labelled as 'nimbyism' was first alluded to:

> *Unfortunately, the community is reaching the stage where the word pollution has such an emotional content that the Government may be prevented from doing things of major importance...*
>
> (Legislative Assembly, 24.11.70:8271)

4.7 The Waste Disposal Act 1970

As described in section 4.6.5 above, the Waste Disposal Act had its genesis in the 1969 industrial waste disposal 'crisis', and the ensuing deliberations of the State Development Co-ordinating Committee and its sub-committee of Ministers. Whereas the SPCC Bill was drafted immediately following the recommendations of the sub-committee, the problem of waste disposal was referred to an investigation by a UK waste management expert, Alan E. Barton. Barton completed his report in May 1970 and it was tabled in the Legislative Assembly on 6 August 1970 (Legislative Assembly, 24.11.70:8258). The Waste Disposal Bill was introduced into the Legislative Assembly on 24 November, 1970.

4.7.1 The Barton Report

Barton was a former general manager of Birmingham City Corporation's salvage department and a member of the UK Government's committee on toxic waste disposal (Legislative Assembly, 24.11.70:8258). The terms of reference for his study were:

> *...to investigate and report on all aspects of the critical problem of industrial waste disposal currently confronting metropolitan Sydney and the urban areas adjoining it and, in the light of your professional training and experience, to recommend to the Government of New South Wales (a) measures which should be taken to relieve the immediate problem, and (b) measures which should be taken to prepare for and organize a comprehensive and co-ordinated approach to the overall problem of waste disposal and pollution control in the future.*
>
> (Barton, 1970:ii)

Barton interviewed a total of 65 people, including Government ministers, senior bureaucrats, councillors and alderman, local government staff, and the owners or operators of waste transport and disposal firms (Barton, 1970: Appendix 1) and visited a number of privately and local government owned tips. The study

was completed in six weeks (Barton, 1970:i) and the twenty-two page report comprised sections on:

- the background to the liquid industrial waste 'crisis',
- the methods currently being used to dispose of industrial and municipal waste,
- a summary of the views expressed in a meeting of the major industrial waste producing firms in the Sydney region,
- a summary of the views of the main waste transport and disposal firms,
- brief descriptions of the status of 21 private and local government tips,
- an estimate of the quantities of industrial and municipal waste requiring disposal in 1970 and in 2000,
- descriptions of the activities of the Maritime Services Board and the Metropolitan Water, Sewerage and Drainage Board relevant to water pollution and waste disposal problems,
- conclusions, and
- nine recommendations for action.

The descriptions of the tips Barton visited provide a snapshot in time of the state of Sydney tips. This is summarised in table 4.1.

Barton's assessment is broadly consistent with the problems that had been mentioned in the Annual Reports of the Department of Public Health during the 1960s, but it is worth noting that eight of the twenty-one tips examined were being managed well or satisfactorily, with no pollution by smoke or leachates evident.

Table 4.1: Summary of the state of tips visited by Barton in April-May 1970.

Tip Location	Owner	Waste Type	Standard of Management	Pollution Impacts
Concord	Concord Council	—	Unsatisfactory	—
Bressington Park, Homebush	Strathfield Council	Industrial and municipal	Very poor	Nearby canal polluted
Underwood Rd, Homebush	Private — Bradshaw	—	Poor	Nearby creek grossly polluted
Underwood Rd, Homebush	NSW Railways	Industrial	Poor	—
Underwood Rd, Homebush	Maritime Services Board	Industrial and municipal	Poor	Continuous smoke
Underwood Rd, Homebush	Audley Sand Dredges Pty Ltd	Solid industrial	Satisfactory	—
Auburn	Auburn Municipal Council	Municipal	Extremely bad	Continuous smoke and nearby creek grossly polluted
Burwood	Burwood Municipal Council	Industrial and municipal	Fair	Some emissions from internal fire
Smithfield	Fairfield Municipal Council	Industrial including liquids	Poor	—
Bestic St	Private	Mainly solid industrial	Satisfactory	No leaching visible
Magdala Rd	Ryde Council	—	Good	—
Marsfield Park, Vimeria Rd	Ryde Council	Mainly industrial	Good	—
Silverwater	Parramatta Council	Industrial and Municipal	Satisfactory	—

Table 5.1 (contd): Summary of the state of tips visited by Barton in April-May 1970.

Liverpool	—	Solid industrial and municipal	Satisfactory	No pollution noticeable
Kelso Reclamation Area, Bankstown	—	Solid industrial and municipal	Poor	One water channel through tip badly polluted
Menai	Commonwealth Government, leased to Industrial Waste Collection Ltd	Solid and liquid industrial	Satisfactory	—
Menai	Commonwealth Government, used by Sutherland Shire Council	—	Poor	Considerable leaching into adjacent stream
Salt Pan Creek East Arm	Canterbury Council	Includes liquid industrial	Poor	Pollution of creek and offensive smell
Belrose Tip, Crozier St	Warringah Shire Council	Municipal	Poor	High potential for pollution of creek
Terrey Hills	—	—	Good	—
Careel Bay	—	—	Poor	Potential for pollution

These included both tips operated by local government and tips owned or operated by private firms. From this, it has to be concluded that satisfactory management of tips was not impossible, either by local government or by the private sector. In fact, Barton noted that:

> *The Ryde sites are the best kept tips that I have seen in the Sydney area, and they are to be congratulated upon the appearance of them. If all the sites were like this there would be far less complaints about garbage and industrial solid waste tips.*
>
> (Barton, 1970:16)

In his discussions with the main producers of liquid industrial waste, Barton found that the representatives of these firms all believed that a single authority was needed to take responsibility for the disposal of liquid waste and at least

one representative believed that all forms of pollution should be under the control of a single authority.

The main reason that producers of liquid industrial waste were in favour of a single authority was that, if better control was going to lead to higher costs for the waste transport and disposal industry, then it was important that all firms faced the same costs. Otherwise, if there were firms who were disposing of waste inappropriately and could offer cheap rates, then liquid waste producers would generally have no qualms about using the cheaper services. While Barton does not specifically mention it, it is also possible that the liquid waste producers preferred that they should all face similar waste disposal costs, so that they would not have to compete in areas that might be beyond their control. Essentially, a single authority controlling waste disposal would reduce the risks associated with unexpected or uncontrollable changes to their costs (Barton, 1970:9-11).

The other matter on which the liquid waste producers were in unanimous agreement was the standard of government inspection (presumably by the Department of Public Health and local government). All agreed that the standard was grossly inadequate (Barton, 1970:12).

While it is not immediately clear that avoidance of commercial risks may have been behind the favourable view of centralisation of waste disposal responsibility held by those producing liquid industrial waste, the waste transport and disposal industry made it quite clear to Barton that further investment in the industry on their part would depend on legislation to reduce the current uncertainty.

With respect to Purle Waste Disposal (Australia) Pty Ltd:

> *It was made plain by the company that until legislation was forthcoming that required licensing of industry, the contractors, and tipping sites (whoever controlled them) and so create* [sic] *a sense of responsibility on all concerned with liquid and solid industrial waste disposal, it would be futile to go ahead with actual building* [of a liquid waste treatment plant].
>
> (Barton, 1970:12)

With respect to Hallwell Transport Services Ltd:

> *...the firm said that whatever regulations were made in the future they certainly wished to stay in the business, and they would seriously consider building a suitable type of treatment plant, but again they would not be prepared to do this without some legal security in the sense of licensing of industrial firms so that they could be sure of continued work for their plant.*
>
> (Barton, 1970:14)

While Barton did not devote a section of his report to the views of local government, there is little doubt that he met with a large number of local government staff and councillors (42 of the total of 65 interviews according to his Appendix 1). It appears from two passing comments that local government was also a strong proponent of a centralised authority with responsibility for waste disposal.

> *There is urgent need for jurisdiction and responsibility to be defined at central government level — a point brought out most strongly indeed by the Local Government Association at a recent meeting.*
>
> (Barton, 1970:19)

> *What is certain, however, is that they* [local governments] *are of one voice in asking for central government action to prove that if they* [presumably, local governments] *help to get over the difficult interim period then the need for garbage or industrial waste tips as a means of disposal of all or any liquid waste will be a thing of the past before long.*
>
> (Barton, 1970:20)

In reviewing Barton's conclusions, it seems that his omissions are equally important as those aspects of Sydney's waste management problems to which he drew attention. Barton pointed to a number of factors that he believed were causes of the waste 'crisis'.

Firstly, in arguing that the problem should be tackled at the source, viz. the industries that produced liquid wastes, he implied that industry was one cause of the problem.

> *So many industries have the facilities to despoil nature, but by what right are they assuming that power? Is it that they are employers of labour, contribute much money to a city in spending power or rates, or will be frightened away from a town? If the ravaging of nature denies the public the right to enjoy their leisure hours in a lawful and healthy way, then in time public reaction is so great that those in authority must act.*
>
> (Barton, 1970:20)

Secondly, he reported that he had gained the impression that some local governments did not consider it their duty to provide sites for liquid and solid industrial waste. This was because local governments feared that 'they would be making a rod for their own backs by agreeing to accept more liquid [waste]' (Barton, 1970:20). Presumably, local government engineers and/or health inspectors may have been aware that management of the impacts of liquid waste disposal was more difficult than for municipal waste. The reluctance of local government to accommodate the growing volumes of liquid waste from industry appears to have contributed to the problem by increasing the general oversupply of liquid waste and by encouraging overuse of the limited amount of municipal waste at tipping sites rather than the construction of facilities specifically for liquid waste.

Thirdly, Barton reported that 'most local authorities were not interested in having anybody's garbage or waste other than that from their own district' (Barton, 1970:20). Such an attitude would seem quite reasonable, given that local governments could only recover the cost of operating their tips from their ratepayers, so that, in the absence of any mechanism of transferring rate income between councils, those from outside a council's area were essentially getting a free waste disposal service at the expense of local ratepayers.

Fourthly, some local governments leased the tipping rights at their tips to lessees who were more interested in maximising the returns from tipping charges and salvage than in reducing environmental impacts.

Having attributed Sydney's waste problems to the growing volume of liquid industrial waste generated by industry and a reluctance by councils to accommodate this, Barton also noted that:

> *The means* [to improve the quality of tip management] *already exist through firstly the local authorities, and secondly the State Board of Health, who so often sets the conditions under which a tip may operate but does not follow up frequently and strongly enough.*
>
> (Barton, 1970:21)

On the strength, then, of growing industrial waste volumes, local government reluctance and inadequate enforcement of the State's powers, Barton stated:

> *I have come to the conclusion that the present critical situation confronting the multi-million metropolis of Sydney should never have arisen.*
>
> *It could have been anticipated and suitable progressive action taken if a co-ordinated authority had been in existence, instead of the fragmented forms of control that have dealt with the pollution problem to date. The lack of drive and co-ordination is evident, and if allowed to continue I cannot see why it should be any more effective than it has been so far.*
>
> (Barton, 1970:19)

There are two aspects of analysis of the situation that might have been expected, particularly in an investigation by an overseas expert, but which seem to be absent. Firstly, although Barton specifically mentioned that some tips were very well managed and others were in an appalling state, he did not go beyond vague characterisations such as 'lack-of drive' to analyse in any detail what factors might have been involved in the cases of exemplary tip management that were absent in the cases of unsatisfactory tip management. Such analysis would have been essential to a decision as to whether the situation could be improved by adjustments to the existing arrangements, or whether the only solution was to shift responsibility to a new authority.

Secondly, Barton's consideration of overseas experience with waste management is extremely limited, being restricted to a passing mention in his eighth recommendation that the separation of collection by local government from disposal by a central authority had been recommended in the Redcliffe-Maud Report on Local Government in the UK after a trial of the system in London (Barton, 1970:22).

Barton's recommendations to the NSW Government were essentially fourfold.

- That a single authority should be established to be responsible for the disposal of liquid and solid industrial waste and municipal waste.

- That a system of licensing of waste generating industries, waste transporters and waste disposal areas should be introduced.

- That liquid waste treatment plants should be set up either by a consortium of waste generating industries, or government.

- That controls against pollution would need to be 'comprehensive, effective and actively enforced' so that the cut-rate illegal waste dumping operators could be prosecuted out of existence and so not provide a temptation to industry.

Barton also recommended temporary measures involving allocating contractors to tipping sites with remaining liquid waste capacity, and diverting as much waste as possible in a treated form to the Metropolitan Water, Sewerage and Drainage Board's sewers.

From the Barton Report, it is clear that the idea of a central authority to take responsibility for waste disposal was attractive to the various groups involved for different reasons. For waste generating industries, the authority would remove uncertainty about waste disposal costs and the possibility of industries competing on costs over which they had little control. For the waste transport and disposal industry, the authority also reduced the financial risks associated with remaining in business, or in expanding operations. Apparently, both industries considered the benefits in this reduction in uncertainty and risk outweighed any costs involved in being subject to registration and licensing.

For local government, the nature of the attractions that led to its strong support are not so clear cut. The licensing of tipping areas and the attachment of conditions to these licences could potentially increase the costs of tip management to councils. A central authority might also direct councils to take waste from outside their area, also adding to costs. Against these disadvantages could be set the advantage of being relieved of the technically more difficult and costly responsibility for liquid waste disposal if a central authority was to take over this area.

While not specifically mentioned by Barton, the idea of a central authority to take responsibility for waste disposal would have also been attractive to a State government that prided itself on its achievements in industrial development, because it would relieve it of the discomfort of a number of waste transport and disposal firms having been virtually shut down due to the absence of disposal sites (Legislative Council, 25.11.70:8342).

4.7.2 The Waste Disposal Act 1970

The Waste Disposal Act allowed for the establishment of the Metropolitan Waste Disposal Authority (MWDA) to be responsible for the disposal of industrial and municipal waste within the metropolitan region, defined as being bounded by the Hawkesbury River in the north, the foot of the Blue Mountains in the west, and including the municipality of Camden and the shire of Sutherland in the south (Legislative Assembly, 24.11.70:8212-8213).

The MWDA was to comprise seven members, *viz.* the President of the Metropolitan Water, Sewerage and Drainage Board (MWSDB) and six members appointed by the Governor on the nomination of the Minister for Local Government. The six appointed members were to comprise the director and deputy director as full-time members, two members who 'in the opinion of the Minister have special knowledge and experience in industry' and two members selected from a panel of six names submitted by the NSW Local Government Association (Legislative Council, 25.11.70:8339).

The Act was to introduce a system of registration of premises on which industrial waste was produced and of depots where waste was disposed of, and licences for waste transporters.

The powers of the MWDA were to include the power to:

- carry out or commissioning surveys and investigations into waste matters, provided these met with the approval of the SPCC,
- make, after conferring with the SPCC, recommendations to the Minister for legislative or other action,
- establish regional depots and, if necessary, acquire land for the purpose,
- delegate its powers to a council or members of a council's staff in the area where a regional depot is established,
- place conditions on licences or certificates of registration,

- revoke registrations or licences,
- make exemptions from registration or licensing,
- require the creators of industrial waste to treat or store the waste in particular ways, and
- in emergency situations, require registration certificate or licence holders to take action that would otherwise be in breach of their certificate or licence conditions (Legislative Council, 25.11.70:8388-8341; Legislative Assembly, 25.11.70:8373-8376).

The Act was not to affect any of the waste collection activities undertaken by local government. In addition, due to considerations of the costliness of compensation, the range of tenure types, and the end use of landfills as parks or playing fields, the ownership of existing local government tips was to remain with local government (Legislative Council, 25.11.70:8338-8340).

Appeals over the granting of registration or licences, or over the conditions attached to them, were to go to the SPCC, whose decision would be final. An exception was government departments and public authorities, for whom appeals were to be to the Premier (Legislative Assembly, 25.11.70:8376).

The MWDA was to be funded by fees associated with the issuing of registrations and licences, and by a levy imposed on waste received at depots (Legislative Assembly, 25.11.70:8376). The MWDA could also be allocated such funds from Treasury from time to time as the Treasurer might determine. It appears that this part of the Act was written specifically to allay the fears of local government over the waste levy which had resulted in the Local Government Association lobbying Parliamentarians over the matter (Legislative Council, 25.11.70:8341).

The debate in both Houses on the Waste Disposal Bill seemed once again to be following a script provided by previous debates. Putting aside the fact that the Clean Waters Bill, the State Pollution Control Commission Bill and the Waste Disposal Bill were all dealing with environmental pollution in one way or

another, the introduction of the Bills in rapid succession may have resulted in the fatigue and confusion of some members. The dates and times of the progression of the three Bills through both Houses are shown in table 4.2.

As the table shows, the greater part of the debate on the three Bills occurred over a period of two days, including evenings and the very early morning. Under these conditions, it is not surprising that several Opposition members criticised the Waste Disposal Bill for merely establishing an advisory committee (see, for example, Legislative Assembly, 25.11.70:8390, 8393), a criticism that would have been valid for the Clean Waters Bill, but not for the Waste Disposal Bill.

While fatigue may have resulted in some ill-considered criticism from the Opposition, there were nevertheless a number of valid themes of criticism that had been established in the debate on the earlier Bills. The Opposition re-affirmed its commitment to a single authority for all environmental matters, its doubts over the objectivity of industry representatives, and its belief that environmental standards should be determined on technical rather than political grounds (Legislative Assembly, 25.11.70:8213).

As it had also argued previously, the Opposition maintained that there was a need for technical expertise from the environmental sciences or ecology (Legislative Assembly, 25.11.70:8390, 8394).

In a departure from its suggestions in earlier debates, the Opposition proposed that the two industry representatives on the MWDA should be replaced with two members of Parliament who had experience in industry (Legislative Assembly, 25.11.70:8394).

With his QC's precision, Neville Wran, Leader of the Opposition in the Legislative Council, pointed out that the Waste Disposal Act would result in the 'curious situation' that the President of the MWSDB, as a member of the MWDA would be taking appeals to the SPCC, of which he was also a member.

Table 4.2: Progression of the Clean Waters Bill, State Pollution Control Commission Bill and the Waste Disposal Bill through the Legislative Assembly and Legislative Council in late 1970. Stages for which no debate occurred, such as 1st and 3rd readings in the Legislative Assembly and Introductions and 1st and 3rd readings in the Legislative Council have been omitted.

Bill	Stage	Commencement Time	Finish Time
Clean Waters Bill	Introduction in LA	9:06am, 27.10.70	9:48am, 27.10.70
Clean Waters Bill	2nd reading in LA	10:41am, 4.11.70	12:44pm, 4.11.70 — adjourned
Clean Waters Bill	2nd reading in LA	12:43pm, 5.11.70	4:20pm, 5.11.70 — adjourned
Clean Waters Bill	2nd reading in LA	3:57pm, 10.11.70	4:45pm, 10.11.70
Clean Waters Bill	In Committee in LA	4:45pm, 10.11.70	6:03pm, 10.11.70 — adjourned
Clean Waters Bill	In Committee in LA	3:42pm, 11.11.70	≅7:45pm, 11.11.70
SPCC Bill	Introduction in LA	11:56am, 19.11.70	≅12:38pm, 19.11.70
Waste Disposal Bill	Introduction in LA	4:32pm, 24.11.70	≅4:42pm, 24.11.70
Clean Waters Bill	2st reading in LC	8:52pm, 24.11.70	≅11:46pm, 24.11.70
Clean Waters Bill	In Committee in LC	≅11:46pm, 24.11.70	≅11:47pm, 24.11.70 — adjourned
SPCC Bill	2nd reading in LA	10:20pm, 24.11.70	≅12:48am, 25.11.70
SPCC Bill	In Committee in LA	≅12:48am, 25.11.70	≅12:49am, 25.11.70
SPCC Bill	2nd reading in LC	7:47pm, 25.11.70	≅9:30pm, 25.11.70
SPCC Bill	In Committee in LC	≅9:30pm, 25.11.70	≅9:40pm, 25.11.70
Clean Waters Bill	In Committee in LC	9:40pm,25.11.70	10:15pm, 25.11.70
Waste Disposal Bill	2nd reading in LC	10:15pm, 25.11.70	≅11:07pm, 25.11.70
Waste Disposal Bill	In Committee in LC	≅11:07pm, 25.11.70	11:12pm, 25.11.70
Waste Disposal Bill	2nd reading in LA	3:30pm, 25.11.70	7:50pm, 25.11.70
Waste Disposal Bill	In Committee in LA	7:50pm, 25.11.70	8:22pm, 25.11.70

Note: ≅ signifies times not given in Hansard but estimated from adjacent entries.

Finally, it is worth noting that several aspects of waste management that were to become central issues in future waste management policy received some attention in the debate over the Waste Disposal Act. Firstly, excerpts from Nixon's speech to Congress on pollution were quoted that referred to the need for a greater proportion of waste to be re-used and recycled (Legislative Council, 25.11.70:8345). Secondly, a report by the World Health Organisation was cited which referred to the essential need to reduce the generation of waste at the source (Legislative Assembly, 25.11.70:8390). The same speaker also described the re-use and recycling processes being used by Coca Cola and Reynolds Metals in the USA for glass and aluminium respectively. In effect, the NSW Parliament had been introduced in 1970 to all the elements of the waste management hierarchy (reduce, re-use, recycle, dispose) — a concept which was not to appear in policy discourse until the late 1980s, but which subsequently became the underpinning philosophy of the Waste Minimisation and Management Act of 1995.

5 THE METROPOLITAN WASTE DISPOSAL AUTHORITY

As described in section 4.8.2, the statutory authority established by the 1970 Waste Disposal Act to take responsibility for waste management in the Sydney region was named the Metropolitan Waste Disposal Authority (MWDA). It became the Waste Management Authority (WMA) on 1.7.1989 and the Waste Recycling and Processing Service (WRAPS or Waste Service) on 1.3.1992. Although the title of this chapter refers only to the first (and, to date, the longest lasting) of the three names, the chapter deals with this statutory authority from its establishment until December 1995. Similarly, in the material that follows, where statements are being made that refer to the period from the early 1970s to

the mid-1990s, the term MWDA is used to describe collectively the MWDA and either or both of its successors.

5.1 Directors, Powers, and Objectives

On 14 May 1971, the Waste Disposal Act was proclaimed and the membership of the MWDA and the State Pollution Control Commission (SPCC) announced by the Minister for Environment Control, Bob Beale (SMH, 15.5.71:15; MWDA, 1971-72:1). The director, Richard Connolly, had a background in local government, as did the management staff (appendix B5.1:1; Butlin, 1976:263).

According to Butlin (1976), the technical staff were mainly engineers and:

> *On the whole they are not highly qualified in data handling, planning and management and least of all in research and planning in respect of restraint on generation and encouragement to recycling.*
>
> (Butlin, 1976:263)

The Waste Disposal Act charged the Authority with responsibility for the disposal of waste in Sydney and conferred upon it:

> *...responsibilities, powers, authorities, duties and functions with respect to the transport, collection, reception, treatment, storage and disposal of waste within the Metropolitan Waste Disposal Region; and for purposes connected therewith.*
>
> (MWDA 1971-72:2)

According to the MWDA's citing of sections of the Act in its first annual report, its responsibilities, powers, authorities, duties and functions included:

- carrying out and commissioning surveys and studies,
- conferring with the SPCC on matters relating to waste and recommending to the Minister for Environment Control any legislative or other action considered necessary,
- providing reports to the Minister on waste-related matters referred to the MWDA by the Minister, and
- providing reports, on the MWDA's own volition, to the Minister for consideration (MWDA, 1971-72:2-3).

The power the Authority had under the Waste Disposal Act to require industries to treat and store waste in certain ways was not mentioned.

The MWDA was to be funded by a levy on waste delivered to landfills in the Sydney region and in October 1971 announced a waste levy of 64.64 cents per ton, which would raise about $500 000 annually (SMH, 13.11.71:8).

Richard Conolly was Director of the MWDA from its inception in 1971 to December 1985. His position was taken by the Deputy Director, Peter Horsley, whose background was in local government engineering (MWDA, 1984-85:10, 1985-86:3). Peter Horsley retired at the end of 1988 and John Cook was appointed as Director and Chairman of the Authority in January 1989. His background was in mining engineering, and he had previously been the Chief Mining Engineer (Minerals) with the NSW Department of Minerals and Energy. Under his directorship a review of the Authority's mission and objectives was undertaken. The mission and objectives of the organisation changed from an emphasis on waste transport and disposal to what was virtually a description of the waste management hierarchy (table B5.1 in appendix B5).

On 1.7.89, the MWDA became the Waste Management Authority (WMA), brought into effect by the Waste Disposal (Amendment) Act 1989 and the Waste Disposal (Further Amendment) Act 1989 (see section 6.3). The second Act of these two provided for a Board comprising the Managing Director of the Authority (at that time, John Cook) and six part-time members including the Chairperson. In contrast to the Board of the MWDA where industry representatives were in the minority (see section 4.8.2 and appendix B5.1:1), there were no stipulations as to the affiliations of the part-time members of the Board of the WMA. The first part-time members all had industry affiliations (WMA, 1989-90:30-31).

The objectives of the WMA remained those of the MWDA of the previous year as listed in the third column of table B5.1. However, in contrast to the previous year, the WMA emphasised the list of objectives was in 'hierarchical form' (WMA, 1989-90:6), a reference to the waste management hierarchy described earlier in the 1989-90 annual report.

On 1.3.92, according to the terms of the Protection of the Environment Administration Act 1991, the Waste Management Authority (WMA) was abolished and its regulatory functions were transferred to the newly formed Environment Protection Authority. The operating functions were transferred to a new government trading enterprise, the Waste Recycling and Processing Service (WRAPS or the Waste Service). Under the Public Sector Management Act, the Managing Director of the Waste Service, John Cook, was required to enter into a performance agreement with the Minister for the Environment. It is worth noting that one of the performance indicators set for the Managing Director was 'Moving the culture of the Waste Management Authority from a focus on disposal of waste to minimisation and management of waste' (WRAPS, 1991-92:65).

5.2 Waste Management Planning

5.2.1 Taking Stock in 1971

The first task of the newly formed MWDA was to take stock of the available landfill capacity and rates of waste generation, a task that was accomplished with the assistance of a number of consultants' studies (appendix B5.2.1:1-3). While the Authority faced formidable difficulties predicting the future size and nature of the waste stream, it was confident that the likely increase in the waste stream could be planned for (appendix B5.1.1:4). Landfill was nominated as the preferred method of disposal, both for its expedience and the benefits in creating recreational areas when landfills were completed (appendix B5.1.1:5-6). In its 1972-73 Annual Report, the MWDA reduced its estimate of four years remaining landfill space, to 2.5 years (MWDA, 1972-73:8).

5.2.2 Phase I and Phase II Plans

In broad terms, the aim of the MWDA's waste planning was to minimise the cost of waste disposal and its environmental impacts, while accommodating the growth in the waste stream and the decreasing availability of landfill space in the inner parts of Sydney. Throughout most of the 1970s and 1980s, the MWDA maintained that landfill was the most economical method of disposal (appendix B5.2.2:4, 6). The Phase 1 Plan, produced in 1974 and implemented in the mid-

and late 1970s was essentially a 'tidying up' of the existing local government waste management infrastructure (appendix B5.2.2:2). The Phase II Plan, implemented in two stages from the late 1970s through the 1980s, committed the MWDA to a pattern of waste disposal in which waste brought to transfer stations by garbage collection trucks was compacted into long-haul semi-trailers for transport to larger regional landfills on Sydney's outskirts (appendix B5.2.2:4-6).

During the first decade of so of its operation, the MWDA made significant advances in improving leachate control at landfills (MWDA, 1983-84:20-21), although the improved techniques added to the cost of waste disposal. The combination of environmental considerations focussed on leachate control, and the MWDA's goal of minimising waste disposal costs per tonne (appendix B5.2.2:5), led to a view of the relationship between waste quantities and environmental quality that seemed to suggest that increasing the volume of the waste stream would allow it to improve the level of environmental protection for a given level of waste charges:

> *The cost of providing environmental protection measures at waste disposal depots is high and must be spread over a considerable waste input to keep regional depot charges at reasonable levels.*
>
> (MWDA, 1982-81:24)

Similarly, in the 1987-88 Annual Report, within several paragraphs of noting that waste management organisations were increasingly pursuing policies of waste reduction, it was also noted that 'To keep waste disposal charges at a reasonable level, these costs must be allocated over a large waste input' (MWDA, 1987-88:40).

However, in 1989-90, the logic of paying for environmental protection by having a large waste stream was reversed:

> *The degree of impact on the environment from the disposal of community wastes is proportional to the quantities of waste requiring disposal.*
>
> (WMA, 1989-90:12)

Throughout much of the 1980s, the MWDA confidently stated that the supply of large holes resulting from the extractive industries on Sydney's outskirts would continue to provide landfill capacity for at least some decades (appendix B5.2.2:6-7, 9), even if the actual capacity at any one time might be as little as several years (appendix B5.2.2.2:8). By 1988-89, however, the Authority seemed

to be less confident about future landfill capacity, noting that it was 'secured only until about the turn of the century' (MWDA, 1988-89:31).

5.2.3 Taking Stock in 1990 — The Sydney Solid Waste Management Strategy

By 1990, the Authority's confidence in the extractive industries providing it with a supply of large holes on Sydney's outskirts had completely evaporated. In contrast to its claim only nine years earlier that such holes would provide for Sydney's landfill needs for a further 30 years, the WMA warned that 'Landfill capacity for the large quantities of waste is simply not available in the Region' (WMA, 1989-90:9), and 'Adequate landfill capacity is available to meet demand only until 1998 on average' (WMA, 1989-90:11; 1990-91:15). The Chairman and Managing Director of the WMA in their prefatory review in the 1990-91 annual report stated 'Sydney is now facing a landfill crisis. Less than 6 years of landfill capacity remains' (WMA, 1990-91:6). According to informant 4, a former senior manager with the MWDA, an important factor in this unexpected decrease in projected available landfill capacity was the rapid increase in the rate of generation of solid industrial waste in the late 1980s. In addition, as the State Pollution Control Commission placed more stringent controls on private landfills that were disposing of solid industrial waste, more of this waste began to be delivered to MWDA landfills and transfer stations.

The Sydney Solid Waste Management Strategy was published in May 1990. In July 1990, the Strategy was presented to a seminar of Sydney councils. The *Herald* framed the release around the Harbour theme with a headline 'Sydney is making a Harbour of waste' and introducing the report with a warning attributed to the WMA that if Sydney continued to produce waste at the current rates, it would produce enough over the next 20 years to fill Sydney Harbour. The managing director of the Authority was reported as describing the situation with the rising costs of disposal, and the increasing volume of waste, as a 'crisis'. The Authority was reported as already negotiating waste minimisation programs with industry, and encouraging consumers to avoid excessive packaging and less durable goods, and to take up home composting. The Authority recognised that public perception of landfilling had become 'less favourable', but it was still the cheapest waste disposal option (SMH, 4.7.90:3). However, a move away from landfill was necessary because of the lack of suitable land in Sydney. The managing director of the Authority canvassed the possibility of the introduction of mandatory recycling by households and

container deposit legislation to improve recycling returns, but also emphasised that the Authority preferred to work with local councils in a cooperative manner (SMH, 7.7.90:11).
According to the Authority, the Strategy was premised on the assertion that 'Reducing the waste stream is essential' (WMA, 1989-90:9). The Authority further pointed out that the Strategy was a departure from the earlier Phase I and Phase II plans.

> *The production of the Strategy rather than a third plan recognises the limitations of the present waste management system for Sydney in the future, given the dwindling availability of landfill space and that community attitudes towards waste management and the environment have evolved substantially since the mid 1980s.*
>
> (WMA, 1990-91:14)

The Strategy was 'based on the logical hierarchy of waste management techniques' and proposed a 40 per cent reduction in the waste requiring disposal by 2011 (WMA, 1990-91:14).

Following the public consultation period, the WMA summarised the public comment it received as lying in two main areas. Firstly, there was the 'perceived threat' to the environment of landfills. Concerns were also raised about the inequity of the outer regions of Sydney receiving the wastes of the remaining part of the city. In all, the WMA concluded that 'Little positive support was received for landfill or any other form of waste disposal' (WMA, 1990-91:16).

The second area in which public comment was received related to waste reduction targets. The WMA noted that opinion varied from those who called for a zero waste society, to those who felt that the 40 per cent reduction target proposed by the WMA was too optimistic.

> *These two diverse opinions clearly reflected the differing perceptions of the wider community and the waste industry towards increased waste reduction programmes. The wider community, in urging more challenging waste reduction targets, tended to focus primarily on the threat to the environment from the continuing growth in waste generation and disposal. On the other hand, the waste industry tempered this same concern with an awareness of past and current difficulties experienced in developing reliable and economical markets for some recovered materials.*
>
> (WMA, 1990-91:16)

The WMA expressed the view that, in balance, there was fairly widespread support for a more ambitious target than a 40 per cent reduction. The

Government's abandonment of the Londonderry landfill proposal (see section 6.4) and its decision to allocate responsibility for establishing landfills to local government and the private sector, together with the fact that some other States had set themselves 50 per cent reduction targets was seen by the WMA as evidence of this widespread support (WMA, 1990-91:16-17).

In 1990-91, with the demise of the WMA in sight, the NSW Government's decision not to establish any new landfills and the possibility that landfill establishment responsibility would be transferred to local government and the private sector, the Director, on behalf of the Board of the WMA urged the Government 'to retain an integrated regional approach to waste management, in line with overseas trends' (WMA, 1990-91:4). However, it appears that with the transfer of the regulatory functions of the WMA to the EPA and the formation of the Waste Service, a waste planning vacuum formed because, as the 1994-95 annual report of the Waste Service noted: 'there has been no government body with direct responsibility for waste in the Sydney Metropolitan Region since 1992, and initiatives to establish new technologies and divert waste from landfill slowed' (WRAPS, 1994-95:4). According to informant 4, most of the planning staff from the WMA were transferred to the EPA, but in that position had no authority to carry out waste planning.

Whereas the WMA had suggested a waste reduction target in 1990 as part of the sophisticated planning techniques used in the production of the Strategy, from late 1992 onwards, waste reduction targets were set by the Government in such policy documents as the Green Paper, 'No Time to Waste, and 'Waste Reforms' (see sections 7.7, 7.12 and 7.14). The Waste Service then prepared 'waste reduction scenarios, showing how much material would have to be recovered from the waste stream to achieve the targets (appendix B5.2.4:1-3).

5.3 Regional Landfills and Transfer Stations

Throughout most of the 1970s and 1980s, the MWDA was able to establish new landfills and transfer stations without major community opposition (appendix B5.3:1-6, 8-13), although one proposal, for a regional landfill at Cecil Park, was abandoned due to community opposition (appendix B5.3:7). However, following the announcement by the Government in December 1989 of a new regional landfill at Londonderry, major community opposition emerged that was to have significant political consequences in the early 1990s. The

Londonderry proposal is described in detail in section 6.4. While the public was becoming increasingly concerned about the environmental impacts of landfills, there is little doubt that the increasingly sophisticated expertise of the Authority and its Waste Service successor was reducing the likelihood of such impacts (appendix B5.3:17). Also in the early 1990s, the WMA tightened the registration requirements for operators of waste facilities (appendix B5.3:16).

5.4 Incineration of Municipal Solid Waste

The option of incinerating municipal waste was occasionally canvassed by the MWDA and its successors from the 1970s through to the early 1990s when, for example, the energy crisis of the mid-1970s focused attention on municipal waste as an energy source, and when landfill was becoming a less attractive option in the early 1990s due to community opposition (appendix B5.4:1-4).

5.5 Liquid Waste

Since the 1970s, the liquid waste produced in Sydney by industries such as brewing, tanning and electroplating has been disposed of in various ways: by legal or illegal discharge into the Metropolitan Water Sewerage and Drainage Board's sewers, by illegal discharge into bushland and waterways, by legal disposal on land at the Metropolitan Waste Disposal Authority's Castlereagh Depot, or supplied to the Authority's treatment plant at Lidcombe. The third and fourth disposal routes (the MWDA's Lidcombe plant and Castlereagh Depot) are described in this section. The second disposal route (illegal discharge into bushland and waterways) is described in section 8.6. The first disposal route (discharge to sewers) is only marginally relevant to solid waste management policy and is touched upon briefly in this section (it was the subject of a detailed study by Beder, 1989).

5.5.1 The Central Treatment Plant

The planning for a central plant for treating liquid industrial waste began in 1971. The Lidcombe Aqueous Treatment Plant was completed in October 1988 — seventeen years after planning commenced. The long delay in establishing the plant can be attributed to a number of factors.

Firstly, in the 1970s, there was considerable vacillation, with periods during which it appeared that the MWDA would build and operate a central treatment plant, alternating with periods when the MWDA ceased its planning and research on the assumption that the plant would be built and operated by the private sector (appendix B5.5.1:1-3). According to informant 4, firms had initially expressed willingness to construct a plant, but did not have sufficient information about the waste stream. When the MWDA undertook a survey of industry to obtain this information, the proponents of treatment plants found it impossible to get development consent from local government.

Both the slow pace of MWDA planning and the problem of private sector firms withdrawing after initially expressing interest was, at least in part, due to the extreme uncertainty over the quantity of liquid waste such a plant would be required to treat. For example, Butlin (1976:275) noted that the untreated volume of industrial waste discharged to sewers in the Botany catchment alone was thirteen times greater than the treated discharge to sewers across all of Sydney, and that this volume was some eight times greater than the volume of liquid wastes requiring to be treated at a central plant. Given the relatively loose control by the Metropolitan Water Sewerage and Drainage Board (MWSDB) over industrial waste being discharged into its sewers (see, for example, Beder, 1989), and the possibility of the sudden emergence of political interest in this waste, a central waste plant operator faced two major uncertainties in supply. With the enormous volume of industrial waste going into the sewer system, any slight increase in enforcement activity or improving of standards could result in the plant having insufficient capacity to treat the waste diverted from the sewerage system. If the operator was to turn away this waste, it could attract unwelcome political attention to itself. On the other hand, if standards for discharge to sewers were relaxed, or enforcement relaxed, the operator of the plant could find the supply of liquid waste declining. Lastly, there was little evidence in the early and mid-1970s that illegal dumping of liquid industrial waste in bushland around Sydney would become subject to enforcement any more effective than the largely ineffective attempts at that time. Consequently, the operator always faced the risk that liquid waste transporters would find the treatment plant disposal price unattractive compared to risking illegal disposal.

Apart from the uncertainty due to the availability of illegal disposal and disposal into the sewerage system, the supply of liquid waste for treatment was also subject to Government pressure on industry to treat wastes on site, as

occurred in the late 1970s when a Labor Government came into power (appendix B5.5.1:4-5). There is also some evidence that the Government may have, during the periods when it was thought that the centralised treatment plant would be built by the Government, discouraged private sector investment in such a treatment plant (appendix B5.5.1:1).

A second factor in the delay in establishing a central treatment plant was the combination of the MWDA decision to incorporate a high temperature incinerator in the plant, and the public awareness of hazardous (or 'toxic') waste which began to emerge in the late 1970s, catalysed, at least in part, by the Love Canal affair in the US. This meant that, by the time the MWDA was able to submit a development application for a plant at Fairfield in the early 1980s (a 'toxic waste centre' according to the *Herald*), there was considerable community opposition, which resulted in the withdrawal of the application (appendix B5.5.2:6-9). With discussions occurring at the Federal level about establishing a national high temperature incinerator, the MWDA decided to forego the incinerator component of the plant and submit a development application to establish an aqueous treatment plant at Banksmeadow. This application faced council and community opposition and went to an inquiry under the Environment Planning and Assessment Act, the findings of which raised the possibility of other more suitable sites. The Minister for the Environment, Bob Carr, requested that the MWDA assess these other sites, one of which was adjacent to an existing transfer station at Lidcombe. This was within an area of derelict industrial land (later to become the Homebush Bay Olympic site), and within the boundaries of the Auburn Council, which had long had a fairly lax approach to waste disposal in its area (see, for example appendix B5.5:2-3). The Lidcombe plant was approved in October 1985 and completed three years later (appendix B5.5.1:6-16).

The impact of the uncertainty of the supply of liquid waste was evident a few years later when the capacity of the Lidcombe plant had to be almost doubled as a consequence of the introduction by the Sydney Water Board of more stringent standards for discharge of industrial wastes to its sewers. Several years after that, the financial viability of the plant was threatened when the supply of liquid waste declined due to competition from private sector plants that were taking the more easily treated forms of liquid waste (appendix B5.5.1:18-21).

5.5.2 The Castlereagh Depot

The Castlereagh Depot was established in 1972 as a temporary site for land disposal of liquid industrial waste for several years until a centralised treatment plant was constructed at what was thought at that time would be the near future in 1975 (appendix B5.5.1:1; B6.5.2:6). The Depot was not closed until 1997, and in its twenty-five years of operation was responsible for the land disposal of some one million tonnes of liquid industrial wastes (appendix B5.5.2:34). As described in chapter 7, the Castlereagh Depot played an important role in the waste politics of the early 1990s.

Right from the early 1970s, the Depot was surrounded by political contention. The Castlereagh site had been investigated, and rejected as unsuitable geologically in 1970 (appendix B5.5.2:1). Local residents and the Penrith Council, within whose boundaries the Depot lay, resisted its establishment, but were over-ridden by the powers of the Minister for Local Government (appendix B5.5.2:3-7). Also right from its earliest days, there were suspicions about the disposal of hazardous chemicals on the site. For example, it was claimed in July 1972 that hexachlorobenzene (the chemical which was subsequently stockpiled in large quantities by ICI Australia Ltd and a major reason for the national search for a means of intractable waste disposal in the late 1980s and early 1990s) was being discharged onto the ground at Castlereagh (section 8.6; appendix B5.5.2:3). It would appear also that politicians were aware from the time of establishment of the Castlereagh Depot of the potential for liquid industrial waste disposal to precipitate NIME (not in my electorate) policy paralysis (appendix B5.5.2:4).

During the 1970s and 1980s, concerns about the environmental and health impacts of the Depot were raised from time to time (appendix B5.5.2:15, 20, 22, 31), and the MWDA gave various forms of assurance about the safety of the Depot (appendix B5.5.2:8, 19, 21, 25). Throughout most of the period, it was assumed that the Depot would be eventually rehabilitated for forestry and/or recreational use (appendix B5.5.2:6, 24). When it came to power in 1976, the Labor Government blamed the previous Coalition Government for the unsatisfactory means of dealing with liquid industrial waste (appendix B5.5.2:13). When it replaced the Labor Government in 1988, the Coalition Government was also able to blame the previous Government for the Castlereagh Depot (appendix B5.5.2.30). In 1981 and 1986, the planning permission to operate the site was renewed by the Government's recourse to

various means of over-riding Penrith Council's objections to the Depot (appendix B5.5.2:18, 23, 28).

The amounts of liquid industrial waste delivered to the Castlereagh Depot increased markedly in the mid-1970s and the late 1980s, while there was a period in the early 1980s, during which the volume of waste for disposal fell, due both to economic recession and attempts by the MWDA to have industry treat more of its waste on-site (appendix B5.5.2:11, 17, 26, 32). By 1990, the amount of liquid waste being disposed of at the Castlereagh Depot had increased to 192 000 tonnes per year (appendix B5.5.2:40).

The 1990s brought a significant change for the MWDA in degree of political interest in the operation of the Castlereagh Depot. The newly elected Labor member for Londonderry, Paul Gibson, in whose electorate the Depot lay, actively brought the concerns of his constituents about the Depot before the Legislative Assembly and the media. These concerns centred around outbreaks of animal and crop deaths, cancers and birth deformities on the properties surrounding the Depot following periods of heavy rain (appendix B5.5.2:32, 33-35, 37). Gibson also raised doubts about the validity of the results from the monitoring of groundwater bores around the Depot site (appendix B5.5.2:38).

Gibson's claims resulted in testing of surface and groundwater by various organisations. Waste Management Authority and State Pollution Control Commission testing revealed no contaminants (appendix B5.5.2:36). While the Authority admitted that surface water discharges had taken place during heavy rain, it reassured the public that, according to studies undertaken by consultants, there was no evidence of deterioration in water quality (appendix B5.5.2:43). However, both a local group from the University of Western Sydney and Greenpeace contested these reassurances (appendix B5.5.2:41, 44), while a scientist from the Australian Nuclear Science and Technology Organisation reported that there were high levels of heavy metals in the soil adjacent to the Depot (appendix B5.5.2:47).

Another response by the Government to Gibson's claims was to set up the Castlereagh-Londonderry Catchment Inquiry Steering Committee, comprising Government department, local government and community representatives. This reported in late 1990 that there had been no environmental or health problems that could be attributed to the Depot (appendix B5.5.2:42). However, Gibson had provided information from the Committee to an independent and

un-named environmental scientist who drew contrary conclusions and criticised the validity of WMA and SPCC investigations (appendix B5.5.2:48).

The Government also commissioned an independent environmental audit of WMA facilities (including the Castlereagh Depot). According to the Authority, the audit revealed no significant environmental impacts from the Depot, while local groups claimed the audit supported their belief that contamination from the Depot was causing health problems and birth deformities in animals (appendix B5.5.2:42, 50).

The Government then commissioned in October 1992 a second stage environmental audit and a program of community consultation through a community monitoring committee (appendix B5.5.2:52-53). The Waste Service also undertook an extensive program of testing at the Depot (appendix B5.5.2:56). During the period the audit was being conducted, Gibson reported further animal deaths from tumours, these being also covered in page one stories in the *Herald* (appendix B5.5.2:57). It appears that also about this time the Minister for the Environment, Tim Moore, may have been beginning to appreciate that more than scientific investigation was required to calm public fears:

> *The Government wants to check out not only the factual basis of those concerns but also people's perceptions. Unless the perceptions of people are understood, their concerns cannot be addressed. Giving people a mass of scientific information will not solve their worries or lessen their anxieties.*
>
> (Legislative Assembly, 21.4.93:1393)

However, his successor, Chris Hartcher, was still placing his faith in scientific information a year later, pledging to introduce stricter monitoring and further work at the Depot to 'ensure public confidence in site safety' (Legislative Assembly, 10.3.94:545-546).

The interim, draft and final reports of the second stage audit (released between July 1993 and April 1994) pointed to minor contamination of groundwater immediately below the Depot, but concluded there was no evidence of wider contamination from the Depot. Local groups once more rejected the findings and pointed to continuing animal birth deformities (appendix B5.5.2:55, 59, 60).

In October 1994, the *Herald* ran several prominent articles on the findings of the Department of Health study into the raised incidence of brain cancer in humans

in the vicinity of the Depot. One of these articles made it clear that it would not be possible to establish scientifically any link between the Depot and brain cancers because of the many possible confounding factors (appendix B5.5.2:61).

In April 1995, the newly elected Labor Minister for the Environment announced that the Castlereagh Depot would be closed, while the Minister for Health was quoted by the *Herald* as saying that 'there was no concrete evidence that the site was a "health hazard", but the lingering doubt was enough to warrant its closure and it was better to be "safe than sorry".' (SMH, 22.4.95:7) (appendix B5.5.2:62:63).

5.5.3 A Policy Shift — Industrial Waste Minimisation

Apart from a brief period in the late 1970s when the MWDA announced that industry should wherever possible treat liquid waste so that it could be disposed of in ordinary landfills (appendix B5.5.1), the MWDA was for much of its existence content to take whatever volumes of liquid waste industry produced. However, in the late 1980s, the MWDA once again espoused the policy that industry had a responsibility to reduce the generation of liquid waste. In 1990, the Authority added to its registration conditions for waste generating firms the requirement that such firms prepare waste management plans. By mid-1991, a substantial number of firms had prepared plans which, if adhered to, were estimated to reduce waste generation by 40 per cent (appendix B5.5.3:1-3). Given the significant reduction this approach could achieve, the question arises as to why it had not been tried years earlier. According to informant 4, the concept of a reduction plan as part of negotiated licence conditions had only been thought of in the late 1980s. A further reason for the success of the approach was that, because of the public agitation for the closure of the Castlereagh Depot, industry was aware that continued delivery of waste there was an unlikely option for the future, and that disposal costs were likely to rise.

5.5.4 Intractable Waste and Scheduled Waste

Following the decision of the Joint Task Force on Intractable Waste in December 1988 that a high temperature incinerator would be established in New South Wales (see section 8.6), the New South Wales Government introduced the

Waste Disposal (Amendment) Act in March 1989 to authorise the MWDA to own and operate a high temperature incinerator for the disposal of intractable waste (see section 6.3.1). With the selection of Corowa by the Joint Task Force in September 1990 as the site for the incinerator, the Waste Management Authority established an office in that town, which became the focus of community opposition (appendix B5.5.4:1; section 8.6). With the abandonment of Corowa as a site in November 1990 and the formation of the Independent Panel on Intractable Waste in March 1991, the WMA then proceeded to commence preparatory planning, in the belief that the Panel would recommend an incinerator site somewhere in New South Wales (appendix B5.5.4:1; section 8.6).

The Authority's account of the high temperature incinerator siting efforts suggests that it had not really come to grips with the nature of community fears about toxic waste incinerators. On the one hand, in reporting on the Dames and Moore study that eliminated four of the sites it noted that it had been 'judged that the real or perceived threats of degraded water resources could mitigate against the siting of a HTI [high temperature incinerator]'. On the other hand, it reported that 'educational material has been carried out to factually address community concerns' (WMA, 1990-91:36).

In July 1992, the Independent Panel recommended to ANZECC against a central high temperature incinerator in favour of small scale relocatable plants using alternative technologies (appendix B5.5.4:3). In 1993-94, the Waste Service commenced the development of a community consultation program and the marketing the of Plasma Arc Centrifugal Treatment to the principal holders of scheduled wastes in New South Wales (WRAPS, 1993-94:25).

5.6 Recycling

5.6.1 Early Assessments and Initiatives

From its earliest days, the MWDA regarded recycling as something that was desirable but infeasible until technological innovations or economic conditions made it economically viable (appendix B5.7.1:1-3). The MWDA cited this lack of viability and householder cooperation as reasons for abandoning a trial of source separation in the Manly-Warringah area in 1978 (appendix B5.7.2:1-2).

5.6.2 Recycling Centres

By 1977, the MWDA had begun to open recycling centres at its regional landfills, although it tended to report on the centres in a lukewarm fashion up until the mid-1980s, referring to low prices for recycled materials and poor patronage by the public (appendix B5.7.3:1-3). In the mid-1980s, there were some improvements in prices and patronage (at least north of the Harbour), and the MWDA began to give recycling more prominent treatment in its annual reports (appendix B5.7.3:3-5). However, in the late 1980s, the MWDA also began to downplay the role and potential of the recycling centres, referring to them as 'final filters' to capture the small amounts of remaining recyclables in the waste stream after the bulk had been removed by kerbside collection (appendix B5.7.3:6-7). The amounts collected by the recycling centres in the 1970s and 1980s were minuscule compared to the size of the domestic waste stream, being of the order of 0.3 per cent of the domestic waste stream in 1980 increasing to 0.5 per cent in 1989 (table B5.2).

Another recycling initiative of the MWDA that operated throughout the late 1970s and 1980s was the Recycling Hotline, which provided information to callers on the location of their nearest collection point for recyclables (appendix B5.7.4:1-2).

5.6.3 The Industrial Waste Exchange

The MWDA established and industrial waste exchange in 1977 which provided industry with listings of waste materials available and wanted. By the mid-1980s, the MWDA reported that the listings were tending to be dominated by low value wastes in which there was little interest in utilisation (appendix B5.7.5:1-2). It appears also that the MWDA's role was changing from a provider of information to facilitate market exchanges, to a broker operating in the market (appendix B5.7.5:3). It was not until the period of heightened political and media attention to waste management in the late 1980s and early 1990s, that the WMA began to take more substantive action towards establishing resource recovery plants (appendix B5.7.5:4-6).

5.6.4 Resource Recovery

The recovery of materials from waste in large automated plants was seen by the MWDA in the 1970s as having great potential. Diagrams of the waste stream in the late 1970s showed resource recovery as the major recycling pathway, in contrast to an almost insignificant pathway for source separation (figure 5.1).

However, by the 1980s, the enthusiasm had declined markedly due, it would appear, to concerns about the difficulties of marketing such materials (appendix B5.7.6:1).

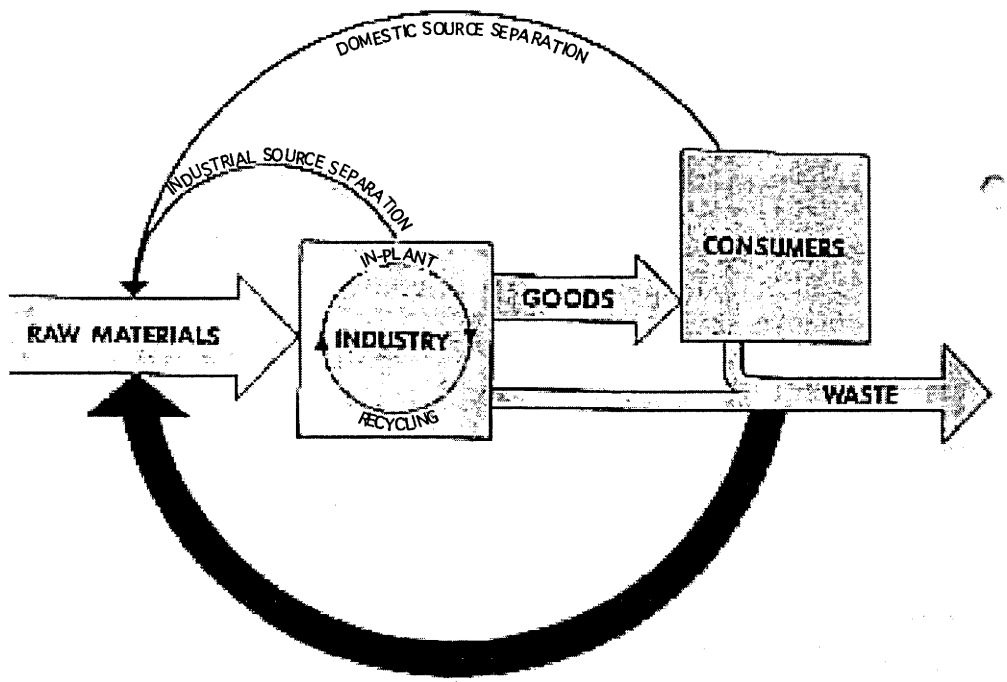
Throughout most of this decade the MWDA maintained a watching brief on overseas developments and conducted a program of waste sampling and analysis. The latter was claimed to be necessary as the high capital investment in resource recovery warranted detailed knowledge of the nature of the waste stream (B6.7.6:1-3).

With the increased political and media attention directed towards waste management in the late 1980s and early 1990s, the WMA then began to take more substantive action towards establishing resource recovery facilities (B6.7.6:4-6).

5.6.5 The Government/Industry Working Party and the Buy Back Centre

In August 1979, the Labor Government established the first of two committees by which it attempted during its term in government to bring about higher levels of recycling. The Government/Industry Working Party comprised a MWDA member, a local government member and four packaging industry members. In December 1981 it recommended that the MWDA should maintain its watching brief on resource recovery, that there should be an awareness raising program with industry, and that kerbside collection and buy-back centres should be trialled as the most feasible options for increasing recycling (appendix B5.7.7:1-3).

Figure 5.1: Figure 6 from the 1978-79 annual report, titled 'Potential for recycling'. The text on the lower broad black arrow (not visible in this reproduction of the figure) read 'Potential for recycling from mixed waste'. (Source: MWDA, 1978-79:26).



The MWDA successfully established a trial buy back centre at Glenquarrie in 1984, but failed to establish a kerbside recycling trial due to the breakdown of negotiations with a council and, presumably, private collectors. According to informant 4, the council was reluctant to become involved because of the additional costs and the fear that income would not cover costs. The implementation of the Glenquarrie Buy Back and Recycling Centre carried the imprint of the packaging industry dominance of the Working Party, insofar as the Centre was intended to be set up as a form of reverse consumerism, with all the trappings of the modern supermarket (appendix B5.7.7:4-6).

The Glenquarrie Buy Back and Recycling Centre did not, however, live up to expectations, being marginally financially viable and receiving poor public patronage. The operation of the Centre was taken over by the Challenge Foundation (an organisation that provides employment for the mentally handicapped) in 1988, thus ending any hope of the Centre living up to the ideal of the reverse supermarket (appendix B5.7.8:1-7).

5.6.6 The NSW Recycling Committee

The NSW Recycling Committee was the second of the two committees established by the Labor Government in an attempt to increase the level of recycling. In comparison to the Government/Industry Working Party, the NSW Recycling Committee had a wider membership — groups that had not been represented on the Working Party included the SPCC, the NSW Recyclers Association, the Australian Institute of Health Surveyors, the Australian Council of Recyclers and the Keep Australia Beautiful Council. The NSW Recycling Committee was formed in 1986-87 and released its report in August 1988. The Committee found that some 22 per cent of the domestic waste stream had commercial value and recommended the improvement of kerbside recycling (appendix B5.7.9:1-2).

5.6.7 Recycling Initiatives in the Late 1980s and Early 1990s

While the Government/Industry Working Party and the NSW Recycling Committee (see sections 6.6.5 and 6.6.6, above) provided a forum for discussions between industry and the NSW Government on the question of raising the amount of recycling, the recommendations of these two groups tended to be cautious small scale initiatives that did not commit industry to any significant investment in recycling infrastructure. However, 1989-90 seems to mark a change in the dynamics of the relationship between the Government and industry. From this time, the WMA appears to have taken a more active role in negotiating recycling initiatives with industry, such as the establishment of a newsprint recycling plant in Albury and the labelling system for plastics that enabled various types of plastic packaging to be identified (appendix B5.7.11:1-4). Another symptom of the changed climate was that the WMA committed itself to a recycling target for the first time in 1989-90 (appendix B5.7.10:1).

In 1990, the Government introduced its Government Recycling Policy which aimed to create markets for recycled materials by requiring Government departments to purchase products with recycled content where possible (appendix B5.7.12:1-3). As noted in appendix B6.7, market development for recycled materials was an integral part of Coalition waste management policy

in the early 1990s, and Government department purchasing was one of the few areas open to a Government committed to less intervention in markets.

After making grants available for several years to local government for developing kerbside recycling schemes, the WMA introduced the Council Recycling Rebate Scheme in January 1991, which provided a rebate of $17.50 per tonne of recyclables collected (appendix B5.7.13:1-3). Viewed with the advantage of hindsight, there seems to be little reason that kerbside recycling could not have been established in the early 1980s when Government/Industry Working Party recommended in favour of it. According to informant 4, the main factor that resulted in the rapid acceptance on kerbside recycling in the early 1990s was that the high levels of public environmental concern and the publicity over the shortage of landfill capacity gave councils a reason for adopting it which outweighed their misgivings about the financial aspects.

5.7 Harnessing Decomposition — Compost and Methane

From 1977 to 1987, the MWDA conducted a program of research into producing chip mulch and compost from tree loppings and garden prunings. The technical aspects were investigated for the first seven years, followed by investigation of marketing aspects. It was not until 1994-95 that the Waste Service awarded a tender for carrying out composting of gardening and wood waste at one of its waste facilities. According to informant 4, the lengthy delay between research and implementation was again due to the reluctance of local government to become involved in composting projects.

The MWDA started trials in 1983 of methane extraction from completed landfills and from that time developed methane extraction networks at a number of its landfills, the methane being used to fire brick kilns and generate power (appendix B5.9:1-2).

5.8 Industry Relations

From 1971 to 1992, the period during which the MWDA and WMA had responsibility for regulation of waste generating, transporting and disposal industries, it maintained good relations with these industries through

formalised liaison via industry representatives. The penal provisions of the Waste Disposal Act were rarely invoked — too rarely according to some (appendix B5.10:1-3).

5.9 The Defence of the Public Sector Role in Waste Disposal

While it had been a Coalition Government that created the MWDA as a public enterprise, from 1980, the Coalition in opposition began to make known its preference for private ownership of waste disposal (appendix B5.11:1-2). By the mid-1980s, the MWDA saw this (and, according to informant 4, the increasing interest in putrescible landfills being shown by the private sector) as sufficient threat to warrant the introduction of a substantial new section in its annual reports that argued for the retention of waste disposal in public ownership, the reasons advanced being that putrescible waste landfills, as high cost investments would be better used and managed after their closure if in public ownership, and that the Authority already contracted out a considerable fraction of its operations to the private sector (appendix B5.11:3).

During the latter half of the 1980s, the Coalition (in opposition until March 1988 and in government thereafter), continued to strengthen its position on the privatisation of waste disposal, culminating with the Green Paper of 1992 and its policy document of 1994, 'No Time to Waste', both of which proposed to allow the private sector to operate putrescible waste landfills, although falling short of privatisation of the WMA (see sections 7.7 and 7.11). Up until the release of the Green Paper, the MWDA and WMA continued to oppose private sector involvement in putrescible waste disposal, arguing that the existing system gave the best of both worlds with the Authority handling regional planning and the private sector tendering for operational aspects (appendix B5.11:4-8).

While the Waste Service publicly supported the Government's policy of competition in the putrescible waste sector, it would have been able to place pressure on the Government to retain its monopoly in the sector by arguing that it would be unable to invest in the composting and resource recovery technologies that were essential to the achievement of the 60 per cent waste reduction target. The reason for this was, presumably, that private sector putrescible landfills would not be attempting to develop the these technologies, thereby making their disposal price lower and introducing uncertainty into the

supply of putrescible waste to the Service (appendix B5.11:9-10). According to informant 4, the Authority did actually withdraw from investing in composting and resource recovery technologies as a consequence of the uncertainty created by the Coalition Government's preference for private sector involvement in putrescible waste landfills.

5.10 Public Consultation and other Responses to Public Opinion

The relationship between the MWDA and the public underwent considerable changes between the 1970s and the 1990s. For most of the 1970s, the MWDA's contact with the public involved providing information and advice in much the same way as any statutory authority of the time (appendix B5.12:1). However in the early 1980s, with the difficulties experienced by both the private sector and the Authority in siting a centralised liquid waste treatment plant, and the observation by Authority staff of such plants had been successfully sited close to residential area through appropriate community consultation, the Authority began to take a more purposeful approach. This assumed that if it made full disclosure of its plans to establish landfills, and informed the public why there was a need for the landfills and how the impact would be minimised, then there would be less problems with community opposition (appendix B5.12.1:1-4). This approach was successfully used with the Mill Creek extension to the Lucas Heights landfill (appendix B5.12:5).

While there is some evidence that the MWDA had some doubts about the wisdom of full disclosure of all plans in the late 1980s (appendix B5.12:7), by the early 1990s, it was obtaining community input to the most central and professionalised of its activities — long term waste planning (appendix B5.12:8-9). With the difficulties of landfill siting in the 1990s (see sections 7.4 and 7.5), the Authority continued to develop a more sophisticated approach, with both public relations strategies based on market research that put across simple messages via the mass media and formalised ongoing public consultation procedures in the vicinity of its facilities (appendix B5.12:13-17).

6 THE WASTE MINIMISATION AND MANAGEMENT ACT 1995

6.1 Context and Precedents

In February 1980, the member for Campbelltown noted in the Legislative Assembly that:

> *Although we are dealing only with amendments to the Act, legislation dealing with waste disposal, still in its infancy, will later occupy many hours of the time of this Parliament and will incur tremendous cost for the community in remedy.*
>
> (Legislative Assembly, 27.2.80:4858)

Although the 'later' to which he referred was to be some ten years later, he was quite correct with regard to the hours of Parliamentary time and the community costs incurred by the Waste Minimisation and Management Act of 1995. This Act brought about a major reorganisation in waste management arrangements in Sydney and followed a period of heightened attention to waste issues in the legislature, in the media, in Government departments and among environmental groups. This commenced in the late 1980s, although there are a number of events starting from not long after the passing of the Waste Disposal Act in 1970 that are relevant to what occurred in the late 1980s and the early 1990s. There are also a number of features of the period between the two Acts which, while not completely independent of what was happening in Sydney with waste management policy, nevertheless served as a context within which the evolution of waste management policy took place.

6.1.1. Growth of Environmental Concern

According to a number of national public opinion polls, environmental concern declined during much of the 1970s and 1980s, but increased sharply in 1989. The volume of waste-related articles in the *Herald*, shows much the same pattern (appendix B6.1.1:1-2). However, the pattern of articles about dangers from chemicals and toxic waste increased for much of the period from 1970, to a peak in 1987, and decreased substantially thereafter (appendix B6.1.1:3-4).

6.1.2. Federal Waste-Related Initiatives

While there was some appreciation of waste issues in the Federal political sphere as early as the 1970s (appendix B6.1.1:1-3), the first substantive policy action did not occur until the early 1990s. At this time, a number of negotiated agreements were endorsed by the Australia and New Zealand Environment and Conservation Council (ANZECC), including the National Packaging Guidelines in 1991, and the National Kerbside Recycling Strategy and the National Waste Minimisation and Recycling Strategy in 1992 (appendix B6.1.1:4-14, 17). The first of these agreements set a target for the reduction in the per capita amount of packaging waste for disposal to be achieved by 2000, the second set targets for the proportions of various types of packaging that would be recycled by 1995, and the third set a target of a reduction in the per capita amount of waste to landfill of 50 per cent by 2000.

There is some evidence to suggest that these targets were set by ANZECC without a great deal of reference to either economic or environmental assessments of what the targets might achieve. This was certainly the view of the Commonwealth Office of Regulation Review in 1993 (appendix B6.1.1:13) and was corroborated by key informant 1 (section 3.5). This person noted that the targets were 'policy devices' rather than 'concrete ceilings', and 'reflect a common goal for improving performance'.

The conservation movement was of the view that the targets did not provide any compulsion for industry, and would therefore be ineffective (appendix B6.1.1:12). However, a number of the targets set in the National Kerbside Recycling Strategy were shown to have been achieved within a few years (appendix B6.1.1:17, figure B6.1).

The National Waste Minimisation and Recycling Strategy acknowledged the concept of the waste hierarchy and, consistent with the confused reporting of waste quantities in the early 1990s (see section 11.2.3), the 50 per cent per capita target was reported as a total quantity target by the *Herald* (appendix B6.1.1:9). Even the 1990-91 annual report of the NSW Waste Management Authority did not make clear the nature of the target being discussed in the period prior to the endorsement of the Strategy (appendix B6.1.1:8). The confusion surrounding the Strategy was noted by an Inquiry into waste management that was held by the Senate Standing Committee on the Environment, Recreation and Arts in 1994 (appendix B6.1.1:24).

The Committee found a serious lack of the sorts of information it considered necessary for rational policy-making and its recommendations were, in the main, incremental adjustments to existing policy, rather than pointing to new directions for policy (appendix B6.1.1:23). The conclusions of the Committee reflected a hybrid of the two interpretations of the waste management hierarchy (the menu of options *v.* the hierarchy of options — see section 11.3.1). The Committee argued that high priority had to be given to waste minimisation, recycling and re-use, and that more economic and environmental information was needed so that choices could be made between these three options to suit particular waste management circumstances (appendix B6.1.1:23).

6.1.3. NSW State Environmental Politics and Policy

The need to respond to environmental concerns in the electorate caused problems for both the Coalition and Labor Governments of the 1970s. The Coalition Government experienced difficulties with the distribution of responsibility and friction between existing departments and the State Pollution Control Commission — difficulties that were not made any less by the outspoken Jack Beale, the first Minster for Environment Control (appendix B6.1.3:1-14).

The emergence of concerns about the environment that were related to the impacts of industry meant that both the Coalition and Labor when in government had to balance the demands of the middle class supporters with pro-environmental views against industry demands (in the case of the Coalition) or trade union demands (in the case of Labor) (appendix B7.1.3:15-16)

The Labor Wran and Unsworth Governments, in power from 1976 to 1988, were responsible for strengthening environmental regulation, although Labor lost the support of the green movement in the 1988 election (appendix B6.1.3:17-25).

A Coalition Government under Premier Nick Greiner came to power in 1988. This Government mixed conservative political ideology and environmental ideals under the banner of 'new environmentalism', which favoured the achievement of environmental goals by harnessing market forces rather than burdening the market with regulation, and the separation of regulatory and operational functions in government agencies. The Minister for the Environment, Tim Moore, appears to have supported the ideal that effective environmental regulation and policy making depended upon objective scientific investigation (appendix B6.1.3:26-27).

As will be described in greater detail below, waste issues became politicised in the 1991 election, in which the Coalition lost its absolute majority in the Legislative Assembly, and the 1995 election, in which Labor won government.

6.2 Early Concerns about the MWDA and Landfills

Throughout the 1970s and early 1980s there was broad support from both sides of politics for having waste management handled by a central government agency (appendix B6.2:2, 15). However, there were also concerns expressed by both sides of politics in the mid-1970s that the MWDA should be making a greater investment in the centralised resource recovery plants of the type that were being established at that time in the USA (appendix B6.2:9, 20). However, it appears that it was the view of the Executive, consistent with the reservations expressed by the MWDA, that centralised resource recovery was not economical, that considerable recycling collection was being carried out already by the glass and paper industries (appendix B6.2:18).

It is worth noting that the concerns expressed in the Legislative Assembly in the mid-1970s involved many of the elements that were to surface in the 1990s, including the increasing per capita generation of waste (particularly packaging and plastics), Sydney Harbour as the measure of volume, increasing waste as symptomatic of a societal deficiency, the sense of urgency due to lack of landfill capacity (then estimated to be 2.5 years), the finiteness of resources and the problem of NIME (not in my electorate) induced policy paralysis (appendix B6.2:4-8, 13).

The mid-1970s also marked the cusp between the old landfill logic whereby waste areas such as swamps and mangrove fringed estuaries were transformed into useful recreational area, and the new landfill logic that saw such infilling as destroying natural areas of ecological value that also had recreational value in their own right. At this time, the Coalition expressed preference for the old landfill logic, while it was Labor that articulated the new landfill logic (appendix B6.2.4:12, 16).

6.3 Legislative Change 1970-1990

Minor amendments of an administrative nature were made to the Waste Disposal Act in 1980 and 1986 (appendix B6.3:1-3).

6.3.1. The Debate on the Waste Disposal (Amendment) and Waste Disposal (Further Amendment) Bills of 1989

The Waste Disposal (Amendment) Bill of 1989 was to change the name of the Metropolitan Waste Disposal Authority to the Waste Management Authority, and to authorise it to own and operate a high temperature incinerator for the disposal of intractable waste. This incinerator was to take waste only from within Australia, and the issue of siting the incinerator was to be dealt with completely separately from the legislation to enable the Waste Management Authority to own and operate the incinerator.

The Waste Disposal (Further Amendment Act) Bill of 1989 aimed to apply several of the tenets of the Government's 'new environmentalism' to the Waste Management Authority. Firstly, regulatory and operational roles were to be separated by transferring the regulatory role to the State Pollution Control Commission. Secondly, the Government attempted to influence the environmental performance of the Authority by restructuring the Board so that it was able to appoint Board Members with environmental expertise (Legislative Assembly, 5.4.89:5910-5912). The Opposition did not take issue with the principle of separation of regulatory and operational roles, but did question whether appointment of environmental expertise to the Board could overcome organisational momentum (Legislative Assembly, 12.4.89:6346).

The debate on the Waste Disposal (Amendment) and Waste Disposal (Further Amendment) Bills of 1989 was distinctly different from previous waste management debates in a number of respects. Firstly, members from both sides of politics repeatedly emphasised the need for community consultation if the high temperature incinerator was to have any chance of being sited. Such was the sensitivity to community concerns, the Government was prepared to relinquish its ideal of increasing privatisation of waste management and ensure that the high temperature incinerator remained in public ownership. The new hypersensitivity about community concern did not, however, prevent some members from expressing the assumption long held by administrative rationalists (see Dryzek, 1997), that the community would accept the need for an incinerator if they were privy to the knowledge of the experts (appendix B6.3.1:4-11)..

The second novel aspect of the debate was the emphasis, from both the Coalition and Labor on a bipartisan approach to the problem of disposing of

intractable wastes. The Government aimed to separate the issue of a site for the high temperature incinerator from the issue of the operation of the incinerator by first establishing the Waste Management Authority as the operator through the Waste Disposal (Amendment) Bill. Politicians on both sides of the House appeared to be only too aware of the potential for policy paralysis if the siting of the incinerator were to become an election issue, rather than being sited, as the Minister for the Environment, Tim Moore, hoped, on 'a totally political value neutral basis' (appendix B6.3.1:12-22).

The Waste Disposal (Amendment) Bill of 1989 was also notable for the increased influence of at least some sections of the environmental movement, both in having their arguments presented and acknowledged in Parliament, and in having amendments suggested by these sections of the movement moved by the Opposition and accepted by the Government (appendix B6.3.1:23-27).

6.3.2. The Waste Management Authority's Legislative Proposals

In May 1990, the Waste Management Authority put forward a number of proposals in a discussion paper for legislation to replace the Waste Disposal Act. Among these proposals were some that were subsequently incorporated in policy documents of either or both the Coalition and Labor Governments, and in the 1995 Waste Minimisation and Management Act, including formalised and enforceable industry waste reduction plans, the retention of the Authority's monopoly on putrescible waste disposal, and the extension of the Authority's area of operations (appendix B6.3.2:1).

6.4 The Proximate Roots of the Waste Crisis — Londonderry

By the late 1980s, there was a need for a regional landfill in the north west region of Sydney. In December 1989, the Parliamentary Urban Development Committee of Cabinet chose a site at Londonderry from a list of sites and recommendations by the Waste Management Authority (appendix B6.4:1-3). The Londonderry site was opposed in the Land and Environment Court by the Penrith Council, which could not refuse a development application by a Crown authority, but sought a full environmental impact statement for the proposal, rather than the lesser document of a statement of environmental effects. The Penrith Council lost its case on technical grounds, but appealed the decision to

the Supreme Court which, in December 1990, ruled that a full environmental impact statement was required (appendix B6.4:5, 8).

By early 1991, public meetings and petitions made it clear to the Government that there was considerable community opposition to the Londonderry proposal (appendix B6.4:11, 14). The Liberal member for Penrith, Guy Matheson, who held the seat by a very slim margin, broke ranks and publicly opposed the proposal. With three other marginal Liberal seats in the vicinity of Londonderry, and an election a few months away, the Government announced in March 1991 that it had abandoned the proposal and that there would be no further landfills or transfer stations established by the Waste Management Authority — rather, these would become the responsibility of local government (appendix B6.4:9-10, 13). Furthermore, the Government believed that the amount of waste requiring landfilling could be cut by half by recycling and composting (appendix B6.4:15).

6.5 The Lucas Heights Extension Proposal

Notwithstanding the Government's change in policy, the Waste Management Authority announced in October 1991 that it intended to extend the Lucas Heights regional landfill, amounting to a doubling in size. The Sutherland Shire Council, with a majority of Labor councillors, mobilised against the proposal (appendix B6.5:1-4). The development application was submitted in March 1992 and, amid substantial expressions of community opposition, the matter was referred to a Commission of Inquiry under the Environment Planning and Assessment Act (appendix B6.5:6-9).

The Commission of Inquiry commenced in June 1992, with three Liberal ministers opposing the Lucas Heights extension on the grounds that it was not consistent with the Government's move towards decentralised waste management. The Commissioner ordered that the Government release the Travers Morgan report into future waste management arrangements in Sydney that had been commissioned the previous year after the Government's withdrawal of the Londonderry proposal. The Government's response was to announce it would appeal the order before the Land and Environment Court (appendix B6.5:13-18).

Following the release by the Government and Sutherland Shire Council of legal opinion and counter-opinion as to the legality of the proposal, and further

public protest, the development application was withdrawn in September upon the release of the Green Paper on Waste Management which set out the Government's policy not to support any landfills that did not have the support of the local community (appendix B6.5:19-25).

6.6 The Castlereagh Overtopping Proposal

While the placement of municipal solid waste on top of the Castlereagh Depot had been considered by the MWDA as early as 1981 (B6.2.2:7), and had been trailed in the late 1980s (B6.5.2:25-29), this proposal became a significant political issue in the early 1990s. While there is no doubt that the overtopping would have provided some relief to the shortage of landfill capacity brought about by the failure of the Londonderry and Lucas Heights extension proposals, the WMA justified its overtopping proposal in January 1992 more as a basis for rehabilitating the area. The community in the vicinity of Castlereagh had already been mobilised over concerns about the health and environmental impacts of the Castlereagh Depot (see, section 6.5.2), and opposed the overtopping proposal. The Labor Opposition gave an undertaking that the proposal would be shelved under a Labor government (appendix B6.6:1-3).

In September 1992, the Labor member for Londonderry, Paul Gibson, introduced into the Legislative Assembly a private members bill, the Castlereagh Liquid Waste Disposal Depot Bill, the main aim of which was to prevent the overtopping of the Castlereagh Depot with solid waste, and remove the legal uncertainty as to whether State Environmental Planning Policy No 3 (SEPP3) (by which the Wran Government had expanded the Depot against the wishes of the Penrith Council in 1981), would allow overtopping or not (appendix B6.6:4-5). The Bill was debated in the Legislative Assembly in September 1992 and March 1993, and passed in April 1993, when two independents voted with Labor to defeat the Coalition minority government (appendix B6.6:5, 7-12).

Of all the debate over the Castlereagh Liquid Waste Disposal Depot Bill, it was probably the analysis provided by the Labor member for St Mary's, Mr A.S. Aquilina, that made the political strategic implications for the Government the most clear. Given the concerns over the shortage of landfill space, any government would want to keep its options open with potential disposal sites. The Coalition Government, provided the Bill was not passed,

could do this by retaining the existing SEPP 3, at the same time limiting political damage by maintaining that SEPP 3 was a Labor initiative and undertaking the environmental audit. However, there was some doubt as to whether SEPP 3 would withstand a legal challenge to overtopping. Furthermore, by not allowing the environmental impact assessment process, the Government was exposed to claims of inconsistency with the considerable emphasis it had been placing on this in other areas of policy (Legislative Assembly, 11.3.93:682-685). Also, since an amendment to the Bill by Labor had been foreshadowed whereby the proponent and consent authorities for any overtopping proposal would be separated, the Government's opposition to the Bill would be inconsistent with the thrust of the Coalition Government's 'new environmentalism' which espoused the principal of separating operational and regulatory roles (Legislative Assembly, 3.11.93:700-701).

6.7 The Green Paper on Waste Management

In September 1992, the Government released its Green Paper on Waste Management. This positioned the Government as the blameless victim of a disposal-focused bureaucracy, the Metropolitan Waste Disposal Authority (appendix B6.7.1:1-2). While the Green Paper's enunciation of the goals of reducing the volume of waste generated and improving the regulation of waste management facilities could be plausibly justified by reference to growing public concern about waste and landfills, the justification for shifting away from the centralised waste management authority that had been the main thrust of the Coalition's 1970 Waste Disposal Act was scarcely plausible, appearing more like rationalisation of the Government's March 1991 decision to disengage from involvement in landfill siting (appendix B6.7.1:3-5).

The Green Paper described five principles that underlay its policy prescriptions: the 50 per cent waste reduction target introduced by the Federal Government the preceding June, a 'voluntary framework' for the achievement of this target, the waste management hierarchy (in a market-dictated menu of options form), full cost pricing of waste disposal and 'the whole community playing a role in waste reduction' (appendix B6.7.2:1-7).

Although many of the Green Paper's proposals were simply restatements of policies already in place, it did propose that:

- the Waste Service, excluding the Castlereagh Depot and Lidcombe Aqueous Waste Treatment Plant, should be made available for purchase by local government,

- communities accepting regional landfills should receive compensation,

- the Independent Regulatory and Pricing Tribunal should undertake a review of waste pricing, and

- the Waste Prevention and Minimisation Plans introduced by the WMA for industry might become part of the licence conditions administered by the EPA (appendix B6.7.3:1-5, 7, 9).

The Government also took pains to refute the arguments for putrescible waste landfills remaining in public control, for enforceable waste reduction targets on industry and for container deposit legislation, although it hinted at the possible introduction of such legislation, and product bans if voluntary approaches were ineffective (appendix B6.7.3:8-14).

One page of the 39 page document was devoted to concrete proposals for action by the Government, These were that the Government would:

- reconvene the inactive New South Wales Recycling Committee (see appendix B6.7.9),

- announce the terms of reference for the Joint Select Committee on Waste Management, and

- establish a Local Government Reference Group to provide local government with improved access to the Committee and greater opportunity to put its views to the Committee (Hartcher, 1992:37).

6.8 The Joint Select Committee on Waste Management

Because the Opposition and independents were able to defeat the Fahey Government on the floor of the Legislative Assembly, and because the independent member for Manly had signalled in February 1992 his intention to introduce a private members bill for a public inquiry into waste management and its privatisation, the Government introduced its own motion to establish a Joint Select Committee in March 1992 (appendix B6.8.1:1-2).

The terms of reference for the Joint Select Committee on Waste Management were announced in October 1992 (not long after the release of the Green Paper) and generally required the Committee to report on the issues raised in the Green Paper. The terms of reference did not mention liquid industrial waste disposal (appendix B6.8.2:1-2).

The Committee comprised ten members, five of whom were Coalition members, three were Labor members, one was the Australian Democrats MLC, Richard Jones and one was the independent MLA for Manly, Dr Peter Macdonald. Perhaps symptomatic of the loss of confidence at this time among legislators in their ability to make decisions that would not be a threat to their political survival, the Committee included for the first time in Parliamentary history Reference Groups who would be privy to the submissions received by the Committee and provide the Committee with responses to the submissions (appendix B6.8.2:3-4).

The Committee commenced its deliberations on 29 October 1992 and completed them on 31 August 1993. The report of the Committee was published in September 1993.

The Joint Select Committee, in comparison with the policy outputs of the Coalition Government during the early 1990s, was significant for the way in which it allowed Labor and the Coalition to further develop and differentiate their respective policy positions on waste management, and for its articulation of some of the more complex and substantive issues in waste management that appeared not to have received serious thought up until that time, at least among parliamentarians.

The differences between the Coalition on the one hand, and Labor and the cross bench members on the other were made clear with the issuing by the

Committee of a majority report and a minority report. The main differences are described below.

- The majority report proposed that only responsibility for achievement of waste reduction goals and regulation of environmental impacts of waste facilities should lie with the State Government. Waste planning should be done by regional groupings of councils and the Waste Service operated as a Local Government Business Enterprise in competition with private sector waste transporters and landfill operators (appendix B6.8.3:8, 23-26). The minority report held that the State Government should have the central role as waste management planner and operator, with the private sector specifically excluded from operating putrescible waste landfills (appendix B6.8.4:2, 3, 6).

- The majority report recommended that container deposit legislation should not be introduced (see section 10.5), while the minority report proposed that container deposit legislation should be introduced in three years if waste reduction targets were not met by the packaging industry (appendix B6.8.4:4).

- The majority report accepted the EPA submission view point that incineration had a role to play in modern waste disposal (see section 8.4), while the minority report recommended a ban on further development of incineration in New South Wales (appendix B6.8.4:5).

The only justification provided for regionalisation of waste management in the majority report was that it was happening in Victoria and the USA (appendix B6.8.3:23).

The more complex and substantive issues in waste management that surfaced with the Joint Select Committee's deliberations generally revolved around the application of neo-liberal political ideology and economic logic to waste management. These included:

- the problem that raising waste disposal prices to discourage the generation of waste is also likely to lead to illegal dumping which is costly to detect and prosecute (appendix B6.8.3:17),

- the problem of maintaining the financial viability of organisations, private or public, that depend on waste disposal charges for their revenue, when the volume of waste being disposed of is decreasing (appendix B6.8.3:18),

- the problem that requiring environmental bonds and guarantees to cover any after-care of landfills may act as a barrier to entry to smaller firms, thus reducing the potential for a competitive waste disposal industry (appendix B6.8.3:22).

The Joint Select Committee hearings were also important in making the interests of the private sector waste industry more explicit. For example, it was evident that, despite the difficulties the MWDA and WMA had experienced in siting large landfills, the private sector was confident that, with appropriate community consultation and access to negotiation with local government, it would be able to site landfills, particularly if there was a means of paying compensation to local communities (appendix B6.8.3:11, 15-16). The larger players, such as Pacific Waste Management, favoured stricter environmental regulation, presumably either to reduce uncertainties in investing in landfills or to act as barriers to entry by potential competitors (appendix B6.8.3:26).

Lastly, it should be noted that the Joint Select Committee majority report recorded the different versions of the waste management hierarchy diagram that were being used by various interest groups to position themselves in the waste management debate of the early 1990s (see section 11.1.3; appendix B6.8.3:3-6).

6.9 Disengagement of the State from Waste Policy

While the State Government's announcement in March 1991 that landfill siting would become the responsibility of local government may have been a defensive strategy precipitated by a looming election, marginal seats in the vicinity of Londonderry and continuing community resistance to the Londonderry proposal (section 6.4), the State Government was then faced with the problem of providing some policy substance to the announcement. While the Green Paper, the Joint Select Committee and 'No Time to Waste' (see 7.12, below), provided some of this substance, the gradual evolution of the Coalition's disengagement from waste policy was marked by a number of other

policy announcements and leaks. In the period from March 1991 to the release of the Green Paper in September 1992:

- the Government announced financial assistance to local government as the State Government moved away from regional landfills to smaller ones owned and operated by local government,

- a leaked Cabinet Office document revealed the Government was considering privatising or handing over to local government the WMA, and

- the Government announced that its policy of non-interference in local government would be implemented using State Environmental Planning Policies (SEPPs) (appendix B6.9:2-4).

6.10 The Formation of Labor Waste Policy

As mentioned in section 6.8, the Joint Select Committee in 1993 was important in the articulation and differentiation of Coalition and Labor waste policy. Other sources suggest that Labor had begun to form its waste policy in early 1992, with the setting of a target of a 25 per cent reduction in the waste going to landfills. In late 1992, the leader of the Opposition, Bob Carr, announced that Labor's election policy included a 60 per cent reduction in waste to landfill, thereby trumping the Federal and State Governments' targets of 50 per cent. The Labor policy also specifically targeted two rapidly growing components of the waste stream, green waste and building waste, as well as requiring the packaging industry to prepare waste management plans (appendix B6.10:1-2).

Labor's waste policy for the 1995 election included a state-wide waste management plan, no ownership of putrescible waste facilities by the private sector, a prohibition on the expansion of incineration in New South Wales, the introduction of container deposit legislation, the phasing out of yard waste and a requirement for industry to meet waste reduction targets (appendix B6.17.3).

6.11 The Policy Issues in 1994 According to the *Herald*

By March 1994, Sydney's waste policy had received sufficient public debate for the *Herald* to be able to put together an account in a waste management feature of what had led to the need to reduce waste, the prospects for reduction and the views of the various interest groups involved. The account reflected several aspects of the evolving waste crisis story-line, *viz.* the leap from landfill capacity shortage to waste reduction without examining whether there was a physical or a political shortage of landfill capacity, and the tendency to focus on household waste that made up only one half of the total urban waste stream generated in Sydney (appendix B6.11:1-4).

6.12 Coalition Policy Document — 'No Time to Waste'

The Fahey Government's policy document on waste management, 'No Time to Waste' was released in June 1994. Compared to the Green Paper, 'No Time to Waste' contained considerably less substance and more rhetoric. Nevertheless, it put forward some concrete proposals, some of which were to appear again in the Labor Government's policy document 'Waste Reforms' the following year, and in the Waste Minimisation and Management Bill at the end of 1995.

'No Time to Waste', in its formulation of the policy problem, further elaborated the idea of landfill capacity as a precious resource, an idea that first appeared in the 1991 in the reports of the WMA (B6.5.2:45) and that also appeared in the Green Paper (appendix B6.7.1:2). The problem was also framed as fragmented planning, failure to use the 'full spectrum' of solutions with the 'right players' using the solutions to which they were best suited (appendix B6.12.1:1-3).

A new element that entered the Coalition's policy reasoning with 'No Time to Waste' was a form of what Ungar (1998) termed the 'small steps' discourse in Canada during the 1990s — environmental advocacy and public education that called for people to undertake small, simple, convenient behaviour changes which, in aggregate, would ameliorate environmental problems (appendix B6.12.2:3-4, 7).

The policy goals listed in 'No Time to Waste' were in effect a statement of the waste hierarchy, although the diagram was not included (appendix B6.12.2:1).

The policy proposals in 'No Time to Waste' included:

- grouping councils into Regional Waste Authorities responsible for regional waste planning,
- stronger regulation of the waste management system by the EPA,
- local control of landfill siting and compensation for 'host' communities,
- the requirement that particular industries prepare waste reduction plans, and
- the corporatisation of the Waste Service (rather than the transfer to local government proposed by the Green Paper and the Joint Select Committee) and the entry of the private sector into putrescible waste disposal (appendix B6.12.3:2-14).

While container deposit legislation was ruled out, 'No Time to Waste' hinted that the Government would be prepared to introduce stricter regulation (appendix B6.12.3:8-9).

The proposals were to be given effect by allocating $35 million to councils setting up Regional Waste Management Authorities, by the EPA negotiating waste reduction plans with industry, by the referral of waste pricing to the Government Pricing Tribunal and a one million dollar waste education campaign (appendix B6.12.4:1-7).

According to reports in the *Herald* following the release of 'No Time to Waste', the Local Government Association and environmental groups had serious concerns about the policies announced in the document, with the former group holding a 'crisis meeting' in early July 1994 (appendix B6.12.5:1-3).

6.13 The Landfill Depots (Moratorium) Bill, 1994

In a move that is difficult to see as other than a fairly desperate attempt by the Coalition Government to shore up electoral support in the coming election, it introduced the Landfill Depots (Moratorium) Bill into the Legislative Assembly in November 1994. According to the Government, the Bill was to give legal

status to the moratorium on new applications for putrescible landfills it had announced in September 1994. The Opposition claimed the main purpose of the legislation was to protect the marginal Liberal seat of Badgery's Creek, in which a private firm had lodged a development application for a putrescible waste landfill. As the Opposition could defeat the Government in the Legislative Assembly with the support of two independents, it announced that it intended to support the Bill, and move amendments to extend it to all putrescible waste landfills, to ban incineration, and to prevent the extension of the Lucas Heights landfill and the overtopping of the Castlereagh Depot (Legislative Assembly, 29.11.94:5911-5912).

6.14 From Landfill Moratorium to 'Waste Reforms'

In the period between the Coalition Government's introduction of the Landfill Depots (Moratorium) Bill to the March 1995 election, it appears to have announced no further significant waste management policy initiatives. In contrast, at least according to the *Herald*, there was a growing consensus among waste management experts, local government and environmental groups that the Coalition's policy of privatisation of waste management would lead to increasing waste to landfill (appendix B6.14:2).

In the March 1995 election, the Coalition lost government to Labor, partly due to the loss of two seats in which waste management had been an issue, Badgery's Creek (appendix B6.12:3) and Gladesville (see section 8.4). Within a short time of assuming office, the Labor Government increased waste disposal charges at landfills, introduced new guidelines on liquid waste discharged to sewers and increased spending on waste minimisation (appendix B6.15.1:1-3). Following the Coalition's proposal in 'No Time to Waste', the Government also referred the issue of waste disposal pricing to the Independent Regulatory and Pricing Tribunal. The report of the Tribunal, in applying the logic of economics to waste management issues, raised the substantive and complex issue of short run versus long run marginal costing for waste infrastructure, although the complexities of this issue were not to surface in subsequent policy debate. Perhaps more significantly, the Tribunal confirmed the probable inaccuracy (of the order of 30 per cent) in the EPA accounting of quantities of waste disposed to landfill — the quantities by which the achievement of the 60 per cent reduction target would be assessed (appendix B6.15.2:1-2).

With the expectation of substantial waste policy reform by the Labor Government, various interest groups began lobbying the Government and publicly positioning themselves in the waste debate. Sutherland Council, which was by then receiving 70 per cent of Sydney's waste at the Lucas Heights landfill put a case for stronger centralised control of waste management to counter the current 'fractured rules'. Other local governments criticised the EPA's regulation of landfill operators. The Waste Service pointed to the need for source separation if the waste reduction target was to be achieved, while the packaging industry was involved in negotiations with the Government over recycling targets. The Private Landfillers' Association, representing small to medium landfill operators, warned that environmental bonds could put its members out of business (appendix B6.15.3:1-3, 5, 7).

6.15 Labor Policy Document — 'Waste Reforms'

The policy document, 'Waste Reforms, was released in November 1995, only a few weeks prior to the introduction of the Waste Minimisation and Management Bill in the Legislative Assembly. The document was more substantial than its Coalition predecessor of the previous year, amounting to some 11 000 words.

In contrast to 'No Time to Waste', the Labor waste policy document did not provide any reasons as to why increasing levels of waste generation was considered to be a problem. Throughout the document, such increases were assumed to be self-evidently problematical. The account of the problems that the policy proposals were intended to address focused instead on the deficiencies in the existing institutional arrangement for management of waste. These deficiencies were seen to be in two broad areas. Firstly, it was argued that, overall, the Waste Disposal Act of 1970 would not bring about a reduction in the generation of waste, because it did not 'guide the community on how to reduce waste' (NSW Government, 1995:1). Secondly, institutional arrangements were described as being 'highly fragmented and there are no formally established systems to draw the parts together' (NSW Government, 1995:6). The lack of uniformity in waste management across councils was also referred to: 'The present situation is basically every council for itself' (NSW Government, 1995:7), leading to the conclusion that 'We need more systematic and integrated waste planning and management across all waste streams' (NSW Government, 1995:10).

The waste management hierarchy featured prominently, albeit in a changed diagrammatic form, in the statement of policy goal, which was to reduce the amount of waste per capita going to landfill by 60 per cent over 1990 levels by year 2000 (appendix B6.16.2:1-2).

Broadly, the policy proposals in 'Waste Reforms' involved both a broadening and focusing of regulation of waste management activities, the retention of putrescible waste disposal in public ownership, the establishment of the Minister for Urban Affairs and Planning as the consent authority for regional putrescible waste landfills, the establishment of regional waste planning and management boards (waste boards), the requirement for nominated industries to develop industry waste reduction plans (the Producer Responsibility Scheme), and the formation of a State Waste Advisory Council. These proposals were to be given effect by the enactment of new legislation, the Waste Minimisation and Management Act.

These proposals were to distribute waste management functions as follows.

- The State Waste Advisory Council was to represent local government, environmental, consumer, industry and EPA interests and advise the Minister on such things as waste research and reduction priorities, the constitution of waste boards and the waste plans they were to prepare, and industry sectors to be brought into the Producer Responsibility Scheme and their waste reduction plans.

- The responsibilities of the State Government were to set waste reduction targets and priorities, to establish and operate the system for regulating waste operators, to provide funding to support the proposed institutional changes and to provide State- and industry-wide education programs on waste.

- The waste boards were to develop waste management plans for their region and be accountable to the State Government for the achievement of targets set by the Government. As with 'No Time to Waste', there was no explanation as to why the economies of scale that were the justification for regionalisation did not also apply to centralisation (appendix B6.16.3:4). It is worth noting that the concept of regionalisation was rejected by the Labor members of the Joint Select

Committee on Waste Management (appendix B7.16.3:6-7).

- Local government was to be accountable to the waste boards for the achievement of the targets, priorities and programs established in the waste plans. It, as formerly, would be able to operate waste facilities and would be the consent authority for such facilities, other than regional putrescible waste landfills. It would also be responsible for the enforcement of generic regulations applying to waste transporters, such as the requirement to cover loads. The intent of the proposed legislation was also to encourage local government to expand its role in waste management from its traditional focus on collection of waste and recyclables to include involvement in the management of industrial and commercial waste.

- The Waste Service would share with local government, the monopoly on operating putrescible waste landfills. It would compete with the private sector in the operation of other waste facilities.

- Those industry sectors nominated under the Producer Responsibility Scheme would be accountable to the State Government for meeting the targets negotiated in their waste plans. In contrast to 'No Time to Waste', which ruled out container deposit legislation, 'Waste Reforms' made no mention at all of container deposit legislation (NSW Government, 1995:6-7, 10).

The Labor waste reforms were to be implemented through the Waste Minimisation and Management Act, a major difference from the approach proposed in 'No Time to Waste'. However, similar to proposals in this latter document, the Labor policy document proposed to establish a Waste Planning and Management Fund to support the formation of the regional waste boards. This fund would be allocated $35.8 million in the first three years, and a further $24.2 million in the subsequent two years (NSW Government, 1995:12).

6.16 The Waste Minimisation and Management Bill 1995

The Waste Minimisation and Management Bill was introduced into the Legislative Assembly on 15 November 1995 by the Minister for the

Environment, Pam Allan. The substance of the Bill was closely similar to what had been proposed in the policy document 'Waste Reforms', released less than two weeks earlier. Either as a response to submissions received after the release of the policy document, or because the policy was still being developed after the drafting of the legislation, or both, the Government proposed to move some 40 amendments to the Bill (Legislative Assembly, 5.12.95:4134).

The main criticism of the Bill by the Opposition in the Legislative Assembly was the lack of consultation in the preparation of the Bill (appendix B6.17.2:1). The waste management hierarchy appears to have suffered the first questioning of its universal validity in this debate (appendix B6.17.2:4). The criticism from the independent member for Manly was mainly confined to detailing a number of aspects on which the legislation fell short of Labor's election commitments (appendix B6.17.3:1).

The debate on the Bill in the Legislative Council was markedly different from that in the Legislative Assembly, in that the Opposition raised more substantial objections to the legislation and, with the Call to Australia Party, brought a great deal of information into the debate that had been provided by lobby groups, mainly from industry, but also from local government. In addition, there was also a strong case put for stronger regulation of industry by the Australian Democrats MLC, the Hon. Richard Jones, and the Greens MLC, the Hon. Ian Cohen. Jones and Cohen argued for container deposit legislation, a ban on incineration and a requirement that the dairy industry retain a certain proportion of milk sales in re-useable bottles (appendix B6.17.4:2-8).

The criticisms against the legislation from the Coalition in the Legislative Council were mainly about effects of the legislation on industry and, to a lesser extent, on local government. For the first time in the Parliament, the existence of a waste crisis was questioned, the Coalition suggesting there were an abundance of landfill sites throughout New South Wales (appendix B6.17.4:9-17).

The Call to Australia Party, being the most favourably disposed to industry among the cross bench parties in the Legislative Council, appears to have received the lion's share of industry lobbying. Reverend the Hon. Fred Nile's speech resembled a who's who of packaging, beverage, manufacturing and business interest groups. It was clear from the concerns raised by these groups that industry had serious concerns about the interventionist nature of the policy

proposals and the power of the Minister. Some groups raised the possibility of capital flight from New South Wales as a consequence of the legislation (appendix B6.17.4:19-27).

It was clear from the Government's response to the Opposition and Call to Australia Party's claims of serious industry concern that many of the lobby groups who were deluging the latter with faxes in the few days before the legislation was debated in the Legislative Council, had in fact publicly supported the legislation in press releases several weeks earlier (appendix B6.17.4:29-36).

For interest groups lobbying the Legislative Council members, the best outcome they could hope for was an amendment to the legislation that shaped the legislation more to their interests. For industry, the key amendment, to be moved by the Coalition, was that industry waste reduction plans should be subject to 'economic and environmental cost benefit analyses', portrayed as the panacea of scientific objectivity to the ills of 'emotive and political' influence on waste reduction plans (B7.17.4:37). For environmental groups, with their commitment to container deposit legislation, the important amendments were the two moved by the Hon. Richard Jones. One of these was that the Minister should be taken to have determined that an industry waste reduction plan was required by the dairy industry and that the plan set a target level of use for refillable milk bottles. The other was that the State Waste Advisory Council may advise the Minister of the need to introduce container deposit legislation if the packaging industry failed to meet its waste reduction targets. Both amendments were passed, the former accompanied by a great deal of conflicting evidence about the environmental desirability or otherwise of refillable milk bottles (appendix B6.17.4:37-48, table B6.17.1).

In the immediate aftermath of the passing of the legislation, reactions from environmental groups were positive, while the reactions of industry groups were mixed, with the packaging industry signalling it would cooperate with the legislation, and manufacturing industry once again raising the spectre of capital flight (appendix B6.17.5:1-3).

7 WASTE SPACES, LITTER AND CLEAN UPS

Solid waste ends up in the environment in three ways: in a dispersed form — litter on land and sea — and a concentrated form — rubbish tips or landfills. An intermediate form is when the physical processes of nature redistribute the dispersed form into a linear concentrated form — rubbish along the tide lines of beaches and harbour foreshores. All three forms of solid waste resting in the environment may catalyse social and political concern, as do proposals to place solid waste in landfills. This chapter deals with the dispersed and intermediate form of solid waste in the environment in 20th century Sydney and the concerns associated with its presence. The concentrated form — rubbish tips — is the subject of the next chapter.

7.1 Ocean Dumping and Beach Pollution

7.1.1. The Watery and Sandy Wastes of 19th Century Sydney

Shelton (1998:10), following Wright (1980) points out that Australia's colonial history has resulted in a change in the meaning of waste over time from meaning areas of land that had not yet been brought into some form of production for human use to discarded materials of human construction that currently have no value in the market economy. As mentioned in section 4.3, much of Sydney's waste in the second half of the 19th century was deposited in gullies or sandy areas such as the City Common or among dunes at Manly. The

characteristic that all these areas had in common was that they were waste areas, not fit for other uses. The City Common (Moore Park), for example, bordered the area of swamps, sand ridges and heathy vegetation known as the Botany Swamps and the Lachlan Swamp (Coward, 1988:79-81).

Nineteenth century Sydney was endowed with a further waste space — the watery wastes beyond the Heads. In 1900, the bubonic plague outbreak in Sydney resulted in a number of hasty changes to waste management policy, one of which was the decision of the Sydney City Council that all city garbage would be taken to sea from 19 March 1900 onwards (Coward, 1988:214). At this time, a number of harbourside councils transported municipal garbage and street sweepings to wharves, where it was tipped into punts that were towed outside the Heads, where the garbage was discharged into the sea. This method had already come under criticism in the United States in the late 19th century (Melosi, 1980:42).

Not only was the ocean beyond the heads a watery waste, but it is likely that many of the ocean beaches were also regarded as waste areas. For example, the diary of a Nuisance Inspector for Manly Municipality reveals that in the 1880s the council buried the nightsoil from the municipality on Steyne Beach and along Pittwater Road adjacent to existing dwellings, resulting in complaints of the odour from residents (Fitzgerald, 1987:75).

The ocean beaches did not become recreational areas until the turn of the century. The New South Wales Surf Bathers Guide in 1910 noted that:

> *The Sydney public have only within the last four years at all appreciated the many seaside resorts that surround the City, and since that time Bondi has been one of the most popular and one of the most frequented beaches...*
>
> *Property in the district has advanced tenfold in value...*
>
> (cited in Birch and Macmillan, 1962:262-263)

Bathing at the ocean beaches was actively discouraged by local ordinances. For example, in 1902, Willie Cochrane, a Manly newsagent, defied the local ordinance against sea bathing during daylight hours. Prosecutions did not deter the many others who followed suit and, in November 1903, the ordinance was repealed, although until 1935 all bathers were required to be covered by a bathing suit from neck to knee (Coward, 1988:253 — Hamlyn, 1975:63, gives the newsagent as W. Gosher and the year as 1903, while Birch and Macmillan,

1962:259, attributes the act of defiance to W.H. Gocher, proprietor and editor of the *Manly and North Sydney News*).

Surfing became a national pastime and by the 1930s was seen as an essential contribution to the vitality of the growing nation. As a New South Wales parliamentarian said in 1932:

> *Surfing is building up a type of young man the physique of whom is not surpassed by that of men of any other country in the world. Our life-savers are equal to any in the world. Reference was made to the importance of physical culture for children in our schools, but they can have no better physical culture than they can get on the beaches.*
>
> (Legislative Assembly, 13.10.32:1069)

With the surfing beaches becoming the gymnasium of the populace, there was growing concern about the garbage washing onto the beaches.

7.1.2. Beach Pollution in the Early 1930s

In the early 1930s, pollution on the ocean beaches south of the Heads was repeatedly raised in the Legislative Assembly by the MLA for Randwick, who was also Mayor of Randwick Council (appendix B7.1:1). On 15 October 1932, Mr Arthur Moverly, the MLA for Randwick and the Mayor of Randwick Council, was successful in moving an urgency motion to have the question of ocean dumping debated in the Legislative Assembly. Moverly then moved that: 'This House is of opinion that steps should be immediately taken to prevent the pollution of the ocean beaches occasioned by the dumping of garbage at sea.'. In speaking to the motion, Moverly quoted from a letter that had been submitted by the surf superintendent at Randwick to the Town Clerk:

> *On Monday, 19th December, Coogee and Maroubra beaches were littered with vast quantities of garbage, consisting of pumpkin and other vegetables, rotten fruit, garden refuse, tins, bottles, etc. Five drayloads of this matter was removed from in front of the dressing shed at Coogee. On Sunday morning, 2nd inst., Coogee Beach was again littered from end to end with an assortment of rotten fruit and vegetables, dead rats, kittens, fowls, on dog, one duck, butchers' shop offal, garden refuse, and other filth so thick that early morning bathers refused to enter the surf.*
>
> (Legislative Assembly, 13.10.32:1070)

The source of the garbage was thought to be Glebe Council, the last of the councils still dumping its solid waste outside the Heads (appendix B7.1:1).

Despite pressure from Moverly on the Government in the Legislative Assembly, and a number of deputations to the Minister for Local Government, the Government argued that it was unable to place bans on ocean dumping for a number of reasons, including the costs that Glebe Council might incur as a result, uncertainty as to whether the rubbish really came from Glebe Council, the Minister's lack of power to direct councils how to dispose of their garbage, and the pending Greater Sydney Bill which would centralise responsibility for waste disposal with a Greater Sydney Council (appendix B7.1:1-3). Eventually, it appears that the need for New South Wales to enact legislation on ocean dumping was overtaken by enactment of similar legislation by the Federal Government (appendix B7.1:6-11).

7.2 Littering and Clean Ups

7.2.1. Littering 1943-1989

The first serious attention by the *Herald* to littering as a newsworthy story appears to be towards the end of World War II, with clean-up campaigns being part of the return to normality after the upheaval of the war (appendix B7.2.1:1). Litter and dumping received increasing attention by the *Herald* through the 1950s and 1960s (appendix B7.2.2:1-3). The approach by the State Government and local councils throughout this period was solely punitive — the employment of litter rangers, the placement of warning signs, and increases in the fines for littering in 1952 and 1960 (appendix B7.2.2:4-9).

Fines were increased again in 1970, through the Local Government (Further Amendment) Act. The debate on the Bill showed that litter could symbolise both the pollution that was of concern about this time, and the moral deficiency of deviant groups in society. Reflecting the debates about compulsion versus cooperation that had occurred with the Water Pollution Bill in 1969 (see, for example, B5.5:17-18), there was debate over penalties versus education with the Local Government (Further Amendment) Bill, although the Coalition had favoured cooperation with the former Bill and penalties for the latter, with the opposite positions being taken by Labor. Also in the debate on the Local Government (Further Amendment) Bill, criticism by Labor of the packaging industry as the cause of the litter problem began to emerge (appendix B7.2.3:1-16).

Despite the increased fines, there appears to have been little impact on litter levels in the early 1970s, due partly to councils' reluctance to use their powers to issue on-the-spot litter fines (appendix B7.2.4:3-4, 8). The apocalyptic dimension of environmentalism was connected to litter and cleaning-up — the Local Government Association launched Anti-Pollution Week in September 1971, with the slogan 'Pollution is people...Survival is up to you'. The *Herald* labelled it the 'big clean-up week' (SMH, 9.9.71:3). Following criticism that the litter fines were not large enough, they were increased again in late 1973 (appendix B7.2.4:3, 6-7).

Local government continued to complain about littering problems in the late 1970s and early 1980s, and there were further calls for increased fines (appendix B7.2.4:16; B8.2.5:1). However, during the 1980s, monitoring of litter levels began to show decreases, despite the increases in packaging. The decreases in litter were attributed to the 'Do the Right Thing Campaign' (see section 7.3, below). Towards the end of the 1980s, media and political attention was again directed to litter, cleanliness and safety in Sydney, with the formation of the Sydney Environs Cleanliness and Safety Task Force (appendix B7.2.5:2-3, 5-8).

7.2.2. Clean Up the Harbour and Australia

There had been some concerns raised in the early and mid-1980s about floating rubbish in Sydney Harbour (appendix B7.2.6:1-5). However, in 1989, the Harbour became the focus of a massive community clean up involving some 20 000 volunteers who collected over 3000 tonnes of rubbish.

The catalyst for this was Ian Kiernan, a property developer who had sought solace in ocean yachting when his business failed with a collapse of the Sydney property market. Kiernan attempted in late 1987 to interest the Minister for Ports in the New South Wales Government in a community clean-up of the Harbour — without success (Kiernan and Jarratt, 1995). The idea was not a new one, having been suggested by the Mayoress of Drummoyne in 1971 — 'Our latest idea is pollution collection parties along the beach with lots of red wine and barbecued steak' (SMH, 9.11.71:14). Kiernan had entered the 1986-87 BOC Challenge, a round the world yacht race. He recorded in his autobiography that he had been horrified by the amount of floating rubbish he had seen in the Sargasso Sea, and found the same sort of rubbish in Sydney Harbour when he returned to Australia (Kiernan and Jarratt, 1995).

In December 1988, the *Herald* reported that Ian Kiernan had formed the Clean Up the Harbour Committee and was planning a clean up campaign on 8.1.89 that was expected to attract 100 000 people.

The main message from the *Herald* report seemed to be one of universal acceptance of guilt and responsibility:

> *'People should not sit back and say it is a problem of the Government,' he said.*
>
> *People are polluting the harbour, not the Government.*
>
> *We are not interested in politics. We have all been guilty.*
>
> (SMH, 3.12.88:7)

The advertising campaign run in late 1988 and early 1989 by Kiernan's contacts in the advertising industry linked together three quite disparate things:

- the global environmental issues that were the source of environmental concern at that time,
- the instinctive dislike that people have for substances that are ambiguous in their properties and/or culturally defined as 'dirty' (see, for example, Douglas, 1966), and
- rubbish in Sydney Harbour.

> *Mo wrote a jingle which immortalised the words 'Yukky Yukky Poo'. It was an advertising campaign which had a direct impact on kids, simplifying for them the vague concerns they had for the future of their environment. They didn't know much about greenhouse gases and the hole in the ozone layer, but they knew what yukky poo was, and the man on the telly was saying that the Harbour was full of it. So come on, Mum, come on Dad, let's go down the Harbour and do something about it.*
>
> (Kiernan and Jarratt, 1995:199)

Starting in mid-December 1988, the *Herald* ran a series of articles with the title of 'Harbour Clean-Up' and a logo showing a traditional household bin with rubbish lying on the ground around it. The first article in the series, a human interest story on the MSB dog boats, carried a photograph that visually connected, the Sydney Harbour Bridge, a topmast schooner, the Sydney Opera House and a scow loaded with rubbish collected from the harbour. It may have been accidental, but the MSB workers on the scow were all immigrant

Europeans (the *Herald* noting that this team was known by other workers as the 'wog boat'). The theme of the text reflected these connections with its mention of 'the finest Harbour in the world' (from Captain Phillip in 1788 — 'We have found the finest harbour in the world, in which a thousand ships of the line may safely ride at anchor.'):

> *'You know,' said Tony as we ploughed back to the depot, a scow-load of rubbish trailing behind, 'some days it's just beautiful ... ' He threw up his hands, without words. 'It's only what people do that spoils it.'*
>
> (SMH, 16.12.88:3)

This one article successfully placed rubbish into a context that had been the focus of Australia's bicentennial celebrations throughout the year — the birth of the nation at Sydney Harbour.

The historical significance of the clean up was further reinforced by the next *Herald* article in the series which referred to teams of workers with community service sentences organised by the Department of Corrective Services:

> *There was, apparently, some discussion among the Clean-Up Day committee: would other volunteers be frightened off by the presence on the foreshores of 'convict labour'?*
>
> (SMH, 2.1.89:3)

While the rubbish bin logo identifying the series remained, the title changed to 'Cleaning up Our Harbour', emphasising the universality of responsibility.

The day after the clean up, the *Herald* devoted part of its front page and half of page four to reporting the haul of 3000 tonnes of rubbish collected by an estimated 20 000 volunteers. The front page article emphasised the breakdown of the barriers of social class:

> *Some arrived in Rolls-Royces and kids came on skateboards. ... 'There were Pierre Cardin groups and fishermen groups,' he* [a local observer] *said. 'I've never seen the people of Watsons Bay and Vaucluse combine so well.'*
>
> (SMH, 9.1.89:1)

The high proportion of plastic in foreshore rubbish was the subject of another article, being portrayed as having the characteristics of many other of the feared risks of modernity:

> *Plastic bottle-tops and stoppers, lids, straws, etc, etc — there was too much to count.*

> *We worry about nuclear attack, cigarette smoke, alcohol, AIDS. What about plastic? The trouble with plastic is it doesn't turn into anything else. It won't go away.*
>
> *If it does, it always turns up somewhere else.*
>
> (SMH, 9.1.89:4)

This connection between litter and other risks was also made by a Democrat member in the Legislative Council, the Hon. Richard Jones, some months later:

> *If one goes on a picnic and leaves cans and bottles lying on the ground, one can be fined. If one throws a cigarette butt out of a car window, which most smokers seem to do, one can be fined. If you are a very powerful transnational corporation which creates a gigantic dump of toxic wastes on the foreshores of Botany Bay, you not only are not fined for this act of environmental vandalism but also manage to persuade the Government to use taxpayers' money to clean up the waste for you.*
>
> (Legislative Council, 18.4.89:6497)

The Organisation for Research and Rescue of Cetaceans in Australia (ORCCA) was reported as having found that half the rubbish collected on the Harbour Clean-Up Day was of types dangerous to marine life by entanglement or ingestion. Six pack beer wrappings were the most dangerous and ORCCA was urging industry to produce biodegradable plastic wrapping (SMH, 14.1.89:7).

Eight days and three rainfall events after the clean up, the *Herald* reported on Ian Kiernan's inspection of the Harbour, in which he noted that the rubbish was likely to return. The *Herald* journalist simplified the relationship between rubbish and estuarine ecosystem health by comparing the litter strewn beaches of Shark Island which:

> *... was not included in the clean-up campaign. Here was a Before the Clean Up Look.*
>
> *The After Look was of tailor on the run with seagulls diving at them and almost sparking waters.*
>
> (SMH, 17.1.89:17)

Kiernan's clean up became Clean Up Sydney in 1990, Clean Up Australia in 1991 and Clean Up the World the following year (appendix B7.2.6:7, 9, 18). Clean Up Australia attracted wide corporate support and became a permanent organisation (appendix B7.2.6:10, 28). Kiernan became a spokesperson on waste

management issues generally, or even simply placed in a photo in a news article about waste management (appendix B7.2.6:17-18, 21-22, 27).

The publicity about the Clean Up days continued to connect with wider environmental issues. The 1992 Clean Up Day was launched in January by Ian Kiernan at Taronga Park Zoo. According to the *Herald*, Ian Kiernan said that the location was appropriate because being surrounded by endangered species was a reminder that 'we are the only species that deliberately pollutes and poisons our own environment', and that the clean up would continue to place pressure on authorities to deal with the problem of polluted urban waterways (SMH, 21.1.92:4).

In late February, a run-up article in the *Herald* showed Ian Kiernan at a recreation and wetland area adjacent to the Cooks River that was being used as an illegal dumping ground by householders, demolition contractors and car thieves. Also in the photo was a member of the Cooks River catchment management committee who voice fears about surface and groundwater pollution from the site. Accompanying the article was a logo showing a stylised figure in an Atlas-like pose immersing the outline of Australia in a bowl of water (SMH, 22.2.92:11).

The connection between cleaning up and global environmental issues was also a motivation for those taking part. A reported conversation with a high school student revealed the connection in people's minds between the Clean Up and relatively unrelated environmental issues:

> *'We're* [the present young generation] *scared that in 10 years' time we won't be able to walk outside,' she said. 'We will be the ones to suffer from extreme heat, and we will watch the poles melt and see the seas rise because of the greenhouse effect.'*
>
> *'This is why we are asking the rest of Australia to help us patch these holes* [presumably ozone holes] *and help us save the environment and the world.'*
>
> (SMH, 30.11.92:6)

A similar motivation was mentioned by participants in the focus groups conducted as part of this study (see section 8.8.8).

In the reporting in the *Herald* about the Clean Up days, plastic continued to be singled out as a problematical component of litter to public (appendix B7.2.6:14, 20, 25, 27). The reporting also continued its emphasis on the universality of participation (appendix B7.2.6:12-13) and the strange and

dangerous finds (appendix B7.2.6:19, 25). These dangers, such as syringes, were also mentioned by the participants of the study focus groups (see section 8.8.8). The reporting was also framed in terms of Ungar' s (1998) 'small steps' (appendix B7.2.6:19).

7.2.3. Littering Issues in the 1990s

In addition to the activities of Clean Up Australia, littering continued to attract industry and political attention in the 1990s. The penalties for littering were increased in 1991 (appendix B7.2.7:2). The Litter and Recycling Research Association (a lobbying organisation for the beverage and packaging industry) launched a new version of 'Do the Right Thing' which connected littering to environmental issues (appendix B7.2.7:3), an approach that had been recommended in an evaluation of the campaign in 1990 (see section 5.4 of Reeve, Ramasubramanian and McNeill, 2000).

7.3 The Packaging Industry, Container Deposit Legislation and Litter Politics

As early as 1972, the packaging industry was threatened with the introduction of a packaging levy by the New South Wales Government (appendix B7.3:1-2). Also from the early to mid-1970s, the Keep Australia Beautiful Council, the packaging industry and at least one Liberal MLA expressed their opposition to container deposit legislation, questioning whether it would bring about a decrease in litter levels. They also promoted education and enforcement directed at the litterer and downplayed the role of plastic in litter (appendix B7.3:4-6).

With the election of the Labor Government in May 1976, the Minister for Planning and Environment, Paul Landa moved fairly promptly to use the threat of the introduction of container deposit legislation to obtain some millions of dollars from the beverage and packaging industries to fund a publicity campaign by the SPCC. This campaign was the 'Do the Right Thing' campaign, the publicity component of which emphasised the moral rectitude of putting used packaging in bins (appendix B7.3:7-10).

Measurements of litter levels showed that the campaign was having an effect, although the volume of packaging for disposal continued to increase, becoming as much a waste disposal problem as a litter problem. Consequently, during the mid- to late 1980s, State Governments from both sides of politics saw fit to raise the possibility of container deposit legislation. The Litter Research Association responded by funding, in part, a study of the costs of container deposit legislation by the Federal Government's Business Regulation Review Unit in 1989. This concluded that the costs on industry and others caused by the legislation would far exceed the benefits in litter prevention, a finding that was challenged by the SPCC, the Australian Consumers' Association and the Centre for South Australian Economic Studies (appendix B7.3:8-13, 15 and interview with informant 5).

Although it was publicly known from at least 1977 that there was some sort of agreement between the SPCC and the Litter Research Association, the existence of a written agreement did not come to light until 1989, when it was published as an appendix in the Business Regulation Review Unit report. This was discovered by members of the Waste Crisis Network, an environmental group with links to the Friends of the Earth and the Nature Conservation Council (see section 10.4), in their researches into container deposit legislation and subsequently publicised in their report on container deposit legislation in December 1992. The NSW EPA ended the agreement in February 1993 (appendix B7.3:14, 16-17 and interview with informants 5 and 6).

7.4 Landfill Siting Controversies

Landfill siting controversies is one way by which public concerns about the dangers of waste accumulations are made visible in the media and parliamentary debate. Before turning to these waste dangers in the next chapter, there are several aspects associated with landfill siting controversies that are worthy of note.

Firstly, the spatial distribution of social class in Sydney, at least up until the 1970s, provides some explanation of the success or failure of landfill siting and closure proposals. When the landfill site was north of the Harbour, the siting decision was associated with council galleries packed with professional people, well-organised on-site protests and the formation of local action groups (appendix B7.4.3, B8.4.5, B8.4.6). When the site was south of the Harbour, in

working class areas, the decisions appear to have been taken at a high political level, with little involvement of local residents, even though they may have been just as concerned about the amenity impacts (appendix B7.4.2, B8.4.4). However, after the 1970s, social class and location appear to have had little effect on whether decisions were made with or without the involvement of local residents. The methods of community activism and protest were brought to bear on decisions in all parts of Sydney.

Secondly, the location of landfill controversies described in appendix B7.4.1-15 shows a trend with time from the inner parts of Sydney to the outskirts, reflecting the rationalisation and centralisation of the waste stream brought about by the Metropolitan Waste Disposal Authority.

8 THE AGENTS OF DANGER

Wastes of various forms have always been regarded as sources of endangerment, through the transmission of harm from accumulations of waste to the individual. This chapter describes the sources and agents of danger associated with waste in 20th century Sydney, commencing with a historical survey of the perceived dangers of rubbish tips and landfills, finishing with a description of perceptions of waste, landfills and their dangers among participants in the three focus groups conducted as part of the study.

8.1 The Dangers of Rubbish Tips

The available descriptions of waste disposal in late 19th century Sydney (appendix B8.1.1:1-4) suggest that the only people concerned about the accumulations of waste throughout the city were the health and sanitary professionals of the Board of Health established in the early 1880s. Ironically, as Fitzgerald (1987:76) points out, Pasteur's germ theory that, in the 1860s, replaced the miasmic theory of disease provided less incentive to improve the management of solid waste than did the miasmic theory. For as long as it was believed that diseases were contracted through inhaling the odours of putrescence (the miasmic theory), there were good justifications for improved sanitary services. However, once attention was focused on water supply and food as carriers of disease germs, the justification for sanitary improvements that reduced the odours from accumulations of waste was no longer a matter of human life and death from disease, but rather one of human comfort.

However, the 1900 bubonic plague outbreak focused attention once again on the accumulations of waste in Sydney. Fear of spread of the disease from these accumulations precipitated substantial changes to the arrangements for dealing with waste, including taking waste beyond the Heads and dumping it at sea, and building incinerators (appendix B8.1.2:1-4).

Local rubbish tips continued to be a feature of Sydney's waste disposal throughout most of the 20th century. Concerns about their impact on residents, as reflected in articles in the *Herald*, appear to have declined since the early 1960s due, at least in part, to the Department of Public Health's recommendation to councils of controlled tipping (covering the tipping face daily with soil) commencing in the 1930s, the Clean Air Act of 1961 and the Open Burning Amendment to that Act in 1972 (appendix B8.1.3).

8.2 The Heyday of Incineration in the Early 20th Century

As shown in table B8.1, a large number of incinerators were build in Sydney between 1898 and 1937. Incineration was the preferred waste disposal method of the Department of Public Health for most of the 1930s (appendix B8.2.1:5). In contrast, the Department of Local Government, with its responsibility for ensuring that councils managed their financial affairs wisely, did not view incineration, which was more expensive than controlled tipping or ocean dumping, so favourably (appendix B7.1:1). Incineration also experienced a period of popularity at the end of the 19th century and in the early 20th century in the USA and the impression gained from the writing at that time of those promoting incineration, both in the USA and Australia is that it was regarded as part of the modernisation of the city (in today's terms, what perhaps might be called the application of Fordism and Taylorism to the waste stream) (appendix B8.2.1:1; B8.2.2:2).

It is difficult to ascertain exactly why local government invested in incinerators about this time. The fear of plague has already been mentioned. Incinerators were also marketed aggressively (appendix B8.2.1:4). Possibly, councils were not aware of the maintenance costs and with improvements in road transport infrastructure and tighter air pollution standards in the 1960s, the incinerators became impossibly uneconomic compared to landfill. The most recent record in the *Herald* of the closing of a pre-war incinerator was the Willoughby incinerator in 1967 (appendix B8.2.3).

Incinerators were not without local opposition — residents' concerns generally centring on vermin, smell and smoke. As shown in figure B8.2, the two main periods during which there was a substantial increase in articles about residents' opposition to incineration proposals were in the early 1930s and the late 1950s. In both cases, the residents who were protesting were from the more affluent Eastern and North Shore suburbs (appendix B8.2.2; B8.3.1).

8.3 An Incineration Resurgence in the Eastern Suburbs

While most councils in most parts of Sydney were able to replace their ageing incinerators with landfills, the Eastern Suburbs councils had difficulty in obtaining such sites. After an unsuccessful attempt by the Woollahra Council to establish an incinerator at View Street (due to resident protest and the

Department of Local Government's preference for cheaper landfill) in the late 1950s, the Waverly and Woollahra Councils decided to construct an incinerator at Waterloo in 1969. This subsequently gained the approval of the Department of Local Government. By this time, incineration had become a complex technology and the Councils were no doubt assisted considerably by their links with the Department of Fuel Technology at the University of New South Wales. This Department had hosted the First Australian Refuse Disposal Conference in 1967, at which a number of pro-incineration papers were presented by Department and Council staff (appendix B8.3.1).

The Waterloo incinerator appears, at least from the sources used in this study, to have encountered little resident opposition, perhaps because its location was further from the more affluent suburbs than the View Street site was. The Waterloo incinerator was reported as being 'nearly pollution free' and the ash as being useful as fill in playgrounds, roads and tennis courts. Within a year of opening, the incinerator was claimed by the Coalition Opposition in the Legislative Assembly to be emitting 15 times the maximum level of particulates permitted by the Clean Air Act, due to damage to its pollution control equipment caused by plastics in the waste being incinerated. The incinerator was operated at a reduced rate and on a trial basis while work to solve the problem continued. In 1990, at the height of the national debate over the siting of a high temperature incinerator, the SPCC announced it had found in the incinerator stack gases dioxin and furan emissions at 30-60 times the concentrations permitted overseas. According to the *Herald*, a further study in 1991 found the dioxin levels were 153 times higher than the overseas standard. Further studies were conducted with a view to upgrading the incinerator but, as community opposition to the incinerator increased, the Labor Opposition announced it would close the incinerator if elected. Waverly and Woollahra Councils continued with their plan to upgrade the incinerator or replace it with a waste-to-energy plant, while South Sydney Council, in whose area the incinerator was located, signalled it would refuse a development application. After election to government in March 1995, the Labor Government announced that the incinerator would be phased out (appendix B8.3.2).

8.4 Other Incinerator Proposals in Mid-20th Century

During the 1960s and 1970s various groups of councils in Sydney gave consideration to establishing incinerators, but despite the Health Department

still recommending that incineration was the preferred method of waste disposal, no incinerators were established. Incineration continued to be put forward as a viable alternative in suitable circumstances by the NSW EPA in the 1990s. None of the incinerator proposals in the 1960s and 1970s appear to have brought forth sufficient community opposition to register with the *Herald*. However, by the 1990s, with the publicity about incinerator emissions that resulted from the attempted siting of a national high temperature incinerator, fears about incinerators had grown sufficiently to result in the Ryde Council's proposal to establish an incinerator becoming an issue in the seat of Gladesville in the 1995 election. The Coalition subsequently blamed Labor for distributing 'propaganda' that suggested a 'toxic waste incinerator' would be established (appendix B8.4).

8.5 Residential Incinerators and Backyard Burning

In the 1970s problems began to be experienced with air pollution from the residential incinerators that had been installed in previous years in blocks of home units and flats in inner south-eastern Sydney. Also about this time, it was realised that a great deal of Sydney's air pollution came from backyard burning. By the late 1980s, residential incinerators had been phased out and backyard burning banned by most councils (appendix B8.5).

8.6 Industrial Waste and High Temperature Incineration

A full account of liquid industrial waste disposal in Sydney from the 1960s would be a major study in its own right. Appendix B8.6 provides a summary account, from the perspective of the sources used in this study, from the time of the establishment of the MWDA in the early 1970s to the disbanding of the Independent Panel on Intractable Waste in November 1992. This section only deals with those aspects of liquid industrial waste disposal and high temperature incineration that appear to have had an influence on solid waste management policy in Sydney through the raising of concerns in people's minds about the dangers of these wastes and landfills more generally.

The term 'toxic' was first used in the *Herald* in relation to industrial waste in 1974 by a Professor of Chemistry in describing the wastes from the manufacture of plastics and pesticides. Throughout the 1970s the *Herald*

reported on the problems of illegal dumping of industrial waste into sewers and in bushland on the outskirts of Sydney, although the term 'toxic' was rarely used. This issue was also raised in the Legislative Assembly on a number of occasions in the 1970s. The amounts being dumped were, according to estimates in the early 1970s, of the order of several hundred thousand gallons per week (section 4.7.5). Even as late as 1989, it would appear that about one half this amount was still being dumped illegally each week.

In the late 1970s and early 1980s, the possible dangers from liquid industrial waste became more evident, with the *Herald* reporting several times on the discovery that dioxin contaminated waste had been placed in Sydney landfills in the past. Other events that brought the dangers of such waste to public notice included the visit of the incinerator ship, 'Vulcanus', and the death of a tanker driver in an explosion that occurred at the Castlereagh Depot when he was discharging liquid waste. By the early 1980s, 'toxic waste' had become a dangerous substance in its own right, rather than simply being a description of a number of types of industrial waste that posed health and environmental dangers.

Articles about past dumping of toxic waste in landfills continued in the 1980s, and the danger was emphasised once again with the secret shipping overseas of waste by a chemical company.

By the mid- and late 1980s, the 'toxic danger' news story framing was well established, often employed by the *Herald*'s Tony Horwitz in his stories about 'killer waste' and 'toxic time bombs'. Further publicity about the dangers of toxic waste resulted from the attempts of several companies to establish high temperature incinerators amid strong community opposition, further reports of the discovery of dioxin contamination at waste storage sites, health problems among residents adjacent to the Castlereagh Depot and the death of workers in an explosion adjacent to the Union Carbide storage of dioxin contaminated waste at Rhodes.

Reports of illegal dumping of industrial waste continued through the 1980s, reinforcing the public impression that the government was powerless to deal with this problem. Tanker drivers interviewed by the *Herald* in the late 1980s reported that illegal dumping was 'extensive'. Also in the late 1980s, it became publicly known that ICI had built up a store of 8,000 tonnes of waste hexachlorobenzene at Botany. Extensive contamination by dioxin was

discovered at Homebush Bay and fishing banned in the vicinity because the dioxin had moved into the marine food chain.

The public's sense of a problem out of control was probably increased by the split in the position of environmental groups on high temperature incineration in the early 1990s, with Greenpeace opposing it and the Australian Conservation Foundation favouring it.

Further illegal dumping and industrial waste accidents were reported in 1990, followed by the announcement of Corowa as a high temperature incinerator site. This catalysed intense community opposition, with a protest meeting of 5000 people attended by Christine Milne, who had successfully campaigned against the Wesley Vale Pulp Mill in Tasmania. It was also alleged that death threats had been made against the family of the owner of the motel where WMA staff were staying.

When the Corowa site was abandoned, and the Independent Panel on Intractable Waste formed, reporting on its deliberations kept toxic waste in the news through the early 1990s, as did further illegal dumping articles, and the impounding of a shipment of Australian industrial waste in Belgium.

8.7 Other Sources of Danger from Chemicals

Throughout the 1970s and 1980s, there were continuing news reports about problems with plastics, pesticides and other chemicals (appendix B8.7). These problems were also frequently raised in the New South Wales Parliament (appendix B.7), with the Environmentally Hazardous Chemicals Act being passed in 1985.

8.8 Waste Dangers Today — Focus Group Findings

8.8.1. Introduction

As described in section 3, three focus groups were conducted on the topic of waste (see appendices A2 and A3 for a description of the prompt questions). The following sections describe the responses to a number of discussion prompt questions that elicited the participants' perceptions about dangerous aspects of

waste. The emphasis in these sections is on providing a rich description of participants perceptions, rather than a quantitative analysis of the frequency of particular perceptions. The description is limited to those themes that received considerable discussion within one or more of the groups, or were mentioned in all three groups. While the two Sydney focus groups were divided on age into an under-50s and over-50s group, with a view to contrasting the views of those who had, and those who had not, experienced landfills in the post-war period, relatively little difference was found between the two groups, although the over-50s group was able to identify some differences between present day waste management arrangements and those they remembered from earlier times. As was found in the interviews with the older key informants, the language and the framings of the waste crisis in the 1990s seem to have become the dominant frame through which earlier experiences are expressed.

Paragraphs in italics are quotes of actual discussion. A single paragraph generally represents the unbroken contribution of one participant from any of the three focus groups. Occasionally, where the sense of the discussion is better conveyed by including the response of one participant to another within the same focus group, the two contributions are separated by a slash.

8.8.2. A Graphic Symbol to Represent a Landfill

Participants were asked to draw or describe a graphic symbol that they would use for placards and letterheads on protest letters if they were protesting against a landfill that was proposed to be established in their vicinity. The symbol had to be chosen for its maximum impact

A number of graphic symbols were put forward by the participants.

Garbage bins

> *A garbage bin tipping out with stuff coming out and the words 'Don't dump on us'*
>
> *But I thought for a placard, something like a rubbish bin you know like the old... not the wheelie bins ... the old fashioned sort of rubbish bin, just spilling over.*
>
> *But the rubbish bin spilling over, that would be my first choice. Maybe some plastic shopping bags falling out of the old fridge, blowing away in the wind.*

I've drawn a garbage bin which symbolises a community, and rubbish being thrown into the bin and saying 'we're not garbage bins'.

I had a dead tree, fire, a polluted environment... like the haze. Also with a rubbish bin on its side, and spilling out. And a poison bottle. And a dead bush. All dead. A bottle with a skull and cross bones.

Garbage trucks

The only thing I could think of is the old garbage truck tipping something

Very basic, um just the symbol with a dump truck in the middle of basically no tipping here.

I thought of the dump truck, sort of dumping garbage bags plus all open rubbish, but have it set in like a nice paddock with a stream nearby.

The truck up like that and all the plastic bags full of rubbish coming out, perhaps and then... per haps have bottles and the poisons on the load as well.

Children

I just had the same sort of thing, you know, kids playing like in field right next to a field with rubbish and flies flying round it and needles and all that sort of thing

I have an image of small children, small children always seem to get people on side sort of surrounded by broken glass, jagged cans.

Yeah you know some thing with a cross and children on. And saying don't dump your rubbish for our children to get hurt in. Something like that. Needles, you know, all that sort of thing.

Pollutants, poisons, toxics (in addition the passing references above)

...it could be paint or anything that's in filtering through the soil and into the river systems and ocean and I mean just all is repulsive.

A picture of contaminating the environment, sort of symbolising polluting the environment it is dumping toxics which could be harming the environment.

...on one hand you've got small children and what different effects it's going to have on them but then you have also got other poisons and the toxins and how harmful it is, you've got, well the main message, you don't want the dump there

And I had tins of oil spilling out, and cars bodies. And tins of um... large tins of chemicals. Like pesticides and stuff. Sort of tipping over. Dented ones. With lids off. / With one of those skull and cross bones on them.

Plastic bags

The first one which to me means rubbish are those plastic shopping bags. You know those ones that you get like ten or fifteen of every time you go to Franklins. But I thought that wouldn't really look very sort of striking on a placard. That to me is like, that symbolises waste, really, those plastic shopping bags.

You know when you go to the tip it's just like, you know, big piles of plastic bags.

Maybe some plastic shopping bags falling out of the old fridge, blowing away in the wind. / They do it, the wind picks them up and just spreads them. / Or a fence, you know, with plastic shopping bags hanging on it. That seems to be symbolic of a tip as well.

Flies and disease

It's everyone's rubbish. It's household rubbish. Flies. Disease.

Yeah, flies, yeah that sort of thing, stinky smelly

Any dump is contaminated because you have got old rubbish. You can catch anything from that.

A number of common themes can be seen across the contributions of the participants. Firstly, in almost all cases, the rubbish bin symbol was chosen as having rubbish spilling out of it. Similarly, the rubbish truck symbol was chosen as having rubbish spilling from it. In the case of plastic bags, they were represented as blowing around.

Secondly, children were almost always mentioned in association with sharp objects which might harm them. Thirdly, the representations of landfills as polluted places included a range of substances responsible for the pollution, such as paints, chemicals, pesticides, poisons and toxic substances.

8.8.3. Comparison with the Past

Participants in the over-50s focus group were asked whether they would have used the same graphic symbol in the past. One person suggested that the way people protested about something like a landfill was different in the past.

> *I think in the 1950s we didn't have a visual sense of* [unclear] *and things like logos would have been very strange to us. If we were upset about something you would get a big sheet of paper and you would work out a petition and go along the street and get everyone to sign it and send it off to the local council and that was the way or well somebody in authority and you didn't make this great* [unclear] *with this logo emblazoned all over the place.*

Transfer stations were seen as possibly more dangerous than landfills.

> *A tip isn't um like what it was twenty years ago now it is a complete manufacturing plant, so then you've also go to worry about what they're doing uh what they're burning there if they're putting out fumes, putting out just disposal of rubbish, it's not just an old tip any more. So they could be pumping out all sorts of things from there.*

Attention was also drawn to how the amount of packaging had increased.

> *Um that's my recollection of the 1950s. We didn't have all this packaging, you went to the grocer shop, in the country you were still getting served then. Not at the supermarket. And they got you out a pound of monte carlos or whatever and put it in a paper bag we didn't have a plastic tray contained inside another thing inside another thing um. If you want to go and buy a biscuit now that s how you get it*

8.8.4. Impacts of a landfill

Participants in all three focus groups were asked, in the event of their imagined protest against a proposed landfill being unsuccessful, how they believed things would change in their surroundings and in their home as a consequence of the presence of the landfill. The direct impacts mentioned frequently were noise, smell and trucks. Some were concerned about rubbish not being confined to the landfill.

> *... there is going to be more traffic and just the local person drops their rubbish their greenery or whatever it's dropping on the road. I mean the whole environment is just mucked up because of it. / Yeh so it sort of spreads around the place.*
>
> *Yeah and you've got the wind which blows the rubbish around.*

The indirect health impacts mentioned included stress and various diseases.

Stress

> *Oh well it's going to become worse for something is always at the back of your mind.*
>
> *It is always at the back of your mind right enough. They could misuse it or dump other things that should not be dumped and all that.*
>
> *Stress on people.*
>
> *Well, it's an unhappy environment, like you want your neighbourhood to be you want like after you have worked all day you want to come home to a nice neighbourhood, relax, feel safe, feel comfortable. Not to think oh my god this rubbish is down the end of the street and it's doing this to me and this to me. It builds up stress yeh it builds up stress levels.*

Disease

> *Disease like parasites.*
>
> *Mosquitoes, you get like Ross River fever and they can pass all sorts of things on so there's so many things.*
>
> *It's the rubbish that the animals will be transmitting there as well. The animals that go there*
>
> *What if they got bitten by the rats.*
>
> *You'd have outbreaks of all different diseases I think you'd find. / Yeah just general... the kids would be sicker. They'd be picking up more colds and bugs and stuff going round.*

A number of participants mentioned the environmental impacts of a landfill.

> *And it would go into the watertable...*
>
> *You put a dump in the land of course the land is going to soak it up ... if you've got a dump next door and it's all being passed through in that land.*

The lack of knowledge of what may be deposited in the landfill, and distrust of government assurances were also mentioned.

That's what worries me in that you don't know what's going in and what effect it will have on your children and grandchildren or people long after we are dead and gone.

You don't know what's going in when they start off. / Chemicals. Toxic. We have got a big dump at Seven Hills a big industrial waste. It's near the water.

There are always the industrial situations where they dump in the middle of the night and get rid of it then, the same as they put things down the drains and they can now track that back to whoever is putting chemical things and uh they're the sort of things that worry me and then you can't rely on this government investigation. I mean they told us the chemicals were all right and they have now found they cause god knows what, you can't really rely on and even if they found out what did cause can rely on them to tell us about it uh because what are they going to do if they don't dump it there. They're the kind of things that worry me. I don't trust the government whichever lot is in um in that regard. We don't have a good record over the years.

Lastly, the devaluation of property values was mentioned by a number of participants.

8.8.5. Waste in Mountains and Valleys

Participants were asked whether they would be more concerned about waste piled up in a mountain, as compared to waste filling a valley. In two of the groups, there was a consensus that they would be more concerned about the waste mountain, In the third group, participants could think of advantages and disadvantages for both mountains and valleys. The dangers attributed to a mountain of waste appeared to relate to its visibility, generation of gases and the ease with which rubbish might be scattered from it.

It would probably pose more of a health hazard.

It'd have to be. It'd have to sort of... sweat almost wouldn't it. Give off gases. / Cook. / It could ignite.

It'd be just like a compost heap, just worse. It'd have plastic in it. / It probably wouldn't compost as much, though. / Maybe. Maybe it'd be worse because of all the plastics and stuff. / I think it'd be half- probably- you're going to have- / It'd be more toxic.

If you've got a great big mound that's covered in paper that blows away in wind and whatever else is there and as you drive by you see it. But if you drive by and it's a hole in the ground you tend not to see it.

It is worth noting that, for at least one person, the man-made holes in which rubbish is put are also dangerous places.

With that quarry they have already made landscape so at least if it gets filled in we might do something to make it look aesthetically pleasing and find a better use for it, otherwise it's just a hole in the ground. Who wants to go down quarries where um they throw the dead bodies or do the murders.

8.8.6. Material at the Bottom of a Landfill

Participants were asked to imagine a sample taken from a hole drilled to the bottom of a landfill and write down five or six words that described the sample. Participants' contributions were then discussed by each group as a whole.

There were a number of themes that emerged from this discussion.

Sensory descriptions

Black and oozy.

Brown and oozy, or hideous grey.

Smelly greasy

Black and grey.

Oh I just put very dark and muggy with smell.

Unpleasant. Messy liquid.

Um yeh well all this dark murky smelling um this half liquid half dirt type material, manure

I had stench, that was the first thing that I thought would come up. / Stink.

Yes, and it's in a sort of greeny browny sort of colouring. It doesn't have a distinct colour.

I had stinky, sticky, sludge and slime... Stench

I had sloppy sludgy slimy. A fetid porridge consistency with hard and squashable bits.

Well if you go deep enough down you will just get a turgid conglomerate of mullock it wouldn't be compost, there's no way, there would be no air working on it would just be mullock. / [facilitator] So when you say turgid tell me more about turgid. What's- / It's a mixture of dry and wet. / [facilitator] Dry and wet? / Yes it's still a conglomerate, sort of sticky and dry, it would be a mongrel mixture only good for landfill

Many of these descriptions refer to ambiguous matter, neither liquid nor solid.

Descriptions of objects

I was just sort of picturing decaying rubbish like old cars and car toys and things like that, um involves

And then I had like plastic bags because they're going to be there forever because they never break up... they never break down.

All right, well seeing as we are just going to the bottom of the tip, the things that haven't broken down like plastic, metal, glass...

Descriptions of living organisms

...and of course the worms and beetles. / Like those beetles in the Mummy.

Oil. Plastics and worms. Food scraps.

I'd reckon there'd be worms. / I don't, there might be cockroaches, that's all. / Yeah cockies, worms you get from the heat.

I had mush, maggots and cockies.

Worms and that sort of thing. Rotten food.

Um. Wriggly things.

Things growing, mutant.

Mutants and maggots. I mean I know maggots are horrible things but they eat things.

Well I've got sludge. Worms. Old tin rusted cans, you know the old rusted out cans. Tetanus. / And kind of mutant things.

Contaminated, hazardous area, um fungi, toxic waste, it's like this stuff remember when we were at school we would grow in a petri dish, like you put it in and it grows all sorts of stuff.

Dangers and unknown things

Toxic waste.

Well chemicals that shouldn't be there um.

Who knows what lies at the bottom. / You could never guess what's at the bottom of that tip.

All kinds of things could come up. 5000 syringes or whatever else.

Reversion to natural substances

Some participants took a more optimistic view, suggesting that the materials in the bottom of a landfill would revert to natural substances such as soil, compost, peat and coal. Others, however, accepted it would break down, but such substances would not be natural because of the presence of plastics, heavy metals and other contaminants.

Well I was just hoping it would revert to ordinary dirt. It's just going to revert to ordinary, yeah.

I've put a couple of things down. Pure clean humus. I've got to think about what I've been talking about. Um the conditions there are very much like conditions for peat and coal. You can dig it up and use it.

I put that it could be good for compost, it would be dark and it would be wet.

Can I just say something, if depending on what went into this tip this thing that we pulled out from the bottom of the tip could be a really really good fertiliser.

Do you reckon these plastic bags will turn to coal eventually? / We still get plastic in it's original form because it won't break down. We've got broken glass because it won't break down. We have heavy metal residues which filter down from where it's been dumped in the pile which would probably dump the tin and iron from old cans.

It's a mutant soil. Of course it's not soil. All of those things could make soil, but with those additives and poisons, plastic bags and probably some other items, you can't make soil. So it really is a mutation.

It won't form a soil. All the worms and tiny animals take on these chemicals and start to- / Mmm... like the turtles. / Yeah, other creatures... I get ants in my microwave, I don't know how, but I wonder what they're going to become.

8.8.7. Rubbish Dislikes

Participants were asked whether there was any particular type of rubbish they particularly disliked. These discussions were somewhat disjointed, with the discussion shifting rapidly from the mention of a pet hate to consideration of

causes and then wandering off-topic. Several types of rubbish, however, did receive some cohesive discussion and general agreement. These included the dislike of oils and fats, the dislike of plastic packaging materials, both for their perceived increased abundance in shopping purchases and for their presence in litter in public places.

Oils and fats

> *The fat from bloody chops and things. /. I hate oil.[general agreement] / Car oil, engine oil. / And cooking oil. / Yeah, car oil and cooking oil.*

Several people also mentioned ambiguous materials, which may have been oil-like.

> *Gooey sludge. Things that you've got to pack in something else to get rid of it. You know. / You've got to pack it something. Sort of semi decomposed stuff.*

Plastics in packaging

> *Ah! Those rotten plastic strips. You know, that comes on cardboard cartons. / Ties. / Tape [general agreement] / Yeah, oh yeah, they're a menace to society. / Hard plastic ties- / With the little flat metal things on them. / Well what about plastic bags. / I know, I know we do, but when you see an amount of rubbish being dumped by a truck, it's always just one plastic bag after another.*

Plastics in litter

> *Plastic bags and old tyres. They're every way and no matter where you go, you find them on the roads plastic bags. People just throw them away. They're dreadful. It doesn't matter where you go.*

> *Plastic bags. / Mcdonald's packaging. McDonalds, all those things they put hamburgers in. / Oh that styrofoam. / Pizza boxes.*

8.8.8. Clean Up Australia

Participants were asked whether they had been involved on Clean Up Australia days, and why they thought people participated in such large numbers on the first few Clean Up Australia days in the early 1990s. There was discussion of national pride, the dangers to children from syringes and the fact that litter was

present again not long after the clean-up. Several participants referred to Clean Up Australia in the early 1990s being associated with generalised environmental concerns.

> *The advertising like what they showed, like they showed pulling cars out of our ocean and dead fish and like they showed us the devastation of what happened over the last- / And smiling people picking up rubbish.*
>
> *I think that people were scared at the beginning that the world was actually going to end tomorrow and now they've realised a couple of years down the track that we're still here so it can't be as bad as what they're saying.*

8.8.9. Other Aspects of Waste

Fears about waste similar to folk fears of the unquiet dead were expressed by one participant:

> *... we can't just put it in landfills because it's going to come back to us.*

On several occasions discussion of the mutant nature of decomposition products brought forth mention of Teenage Mutant Ninja Turtles, a commercial and cultural production of the late 1980s.

> *You put a dump in the land of course the land is going to soak it up and if it's close enough to anything that grows vegetables, which means to say I like to grow my vegetables out the back and cook all genetic free and not really, if you've got a dump next door and it's all being passed through in that land. So- / Probably be huge tomatoes. Huge. / Ninja tomatoes.*
>
> *It won't form a soil. All the worms and tiny animals take on these chemicals and start to- / Mmm... like the turtles.*

9. RECYCLING AND PACKAGING

9.1 Introduction

While there are many components of the solid (and, indeed, the liquid) waste stream that are being recycled, or are potential candidates for recycling, it is packaging that seems to have attracted the most attention (see section 11.1). Motor car bodies, white goods, clothing and many other consumer goods have been and are being recycled to varying degrees, but none have attracted the sustained attention of the media, environmental groups and politics that packaging has. The content of this chapter reflects this dominance, with substantial sections devoted to paper and plastic recycling, container deposit legislation and the packaging industry, but rather less on glass and metal recycling. Container deposit legislation as a means of encouraging the packaging industry to take greater responsibility for its products has been raised both in connection to litter problems and to unsatisfactory recycling rates. The description of container deposit legislation and the packaging industry is split between sections 9.3 and 9.4 of this chapter, which deal with the recycling aspects, and sections 8.3 and 8.4 of chapter 8, which deal with the litter aspects.

9.2 Recycling

9.2.1 Early Recycling and Resource Recovery

The collection of waste materials for re-use and reprocessing by charitable organisations raising money for hospitals in Sydney goes back to at least before

World War II. During World War II, the collection of these materials came under a State Controller of Salvage for National Purposes to support the war effort (appendix B9.1:1). In the immediate post-war period, many basic materials were in short supply and the Canterbury Municipal Council found it economic to establish a centralised resource recovery plant which separated paper, metal, bottles and rags from municipal waste and composted the remaining organic fraction into fertiliser. However, increasing wage costs and declining prices for recovered materials resulted in the plant's closure in 1957. The closure of the plant did not prevent some enthusiasm for centralised resource recovery being expressed in the Legislative Assembly in the mid-1960s, although the authority proposed to operate such plants did not eventuate (appendix B9:2:1-2). The establishment of centralised resource recovery plants continued to be proposed in the Legislative Assembly in the 1970s and 1980s (appendix B9.3:3), although by the 1980s the Metropolitan Waste Disposal Authority was arguing that there were uncertainties about the feasibility and viability of such plants (see section 5.6.4).

9.2.2 Glass, Metal and Recycling in General

In contrast to demand-driven resource recovery at the end of the waste stream, as exemplified by the Canterbury Council's plant, the impetus for recycling from the 1970s onwards came largely from other than economic considerations, and extracted materials before they entered the waste stream. The fact that environmental organisations in the 1970s perceived a need for recycling (appendix B9.3:3), had its origins in the increase in the packaging of retail goods, which itself was a necessary part of the shift to the supermarket as the dominant form of grocery retailing. The development of light weight aluminium and steel beverage cans that were well suited to the new retailing environment was a significant threat to the market share of the beverage and bottle industries, whose only defence against the rapid growth in the canned beverage market (see, for example, Pausacker, 1975:45-46) was to transfer beverage production to non-returnable bottles (appendix B9.3:10).

The main features of urban recycling and its politics were in place by the end of the 1970s. These included:

- collection of recyclables by local government prior to materials entering the waste stream (but at far lower levels that was to occur in the 1990s) (appendix B9.3:10),

- the appeal of recycling to environmental groups and some politicians as a means of reducing the amount of waste going to landfills and the impacts of landfills on the environment (appendix B9.3:3, 13),

- the promotion of the environmental benefits of refillable bottles by environmental groups (appendix B9.3:6),

- the development of defensive strategies by the packaging and beverage industries to deflect criticism about the increasing volumes of packaging, some strategies probably being a net cost to the industry but others, such as paying for returned aluminium cans, being profitable (appendix B9.3:5, 12),

- the instability of markets for recycled materials which resulted in cyclic expansion and collapse of activity by collection firms (appendix B9.3:2, 9, 11, 12), and

- the difficulties identified by academics and experts in particular disciplines in the measurement of the costs and benefits of recycling (appendix B9.3:8).

There appears to have been little change during the 1980s. As described in sections 5.6.5 and 5.6.6, the Labor Government in 1979 and the mid-1980s attempted to increase the level of recycling by the formation of committees with industry, Government and local government membership. The concept of the buy back centre failed to live up to its promise, and it was not until the Council Recycling Rebate Scheme was introduced in 1991 that source separation by householders and kerbside collection began to bring recycling rates to more substantial levels (section 5.6.7).

As recycling assumed the dimensions of a 'modern-day secular religion' (appendix B9.3:34) in the 1990s, there were more substantial, and more

publicised, doubts raised about its merits, particularly from economists in the Federal Government's Industry Commission and Bureau of Industry Economics (appendix B9.3:24, 33). The *Herald*'s economics writer argued that there was a vicious circle in which politicians were unwilling to take the gloss off recycling by referring to its unprofitability, which meant that people believed that the materials they were putting out at the kerbside were valuable, which meant they were unwilling to pay for kerbside collection, which further exacerbated the unprofitability (SMH, 12.10.94:17). For politicians, however, the economic rationality that recycling ought to yield a net economic and/or environmental benefit was 'out of step with public feeling', as Labor Environment Minister, Pam Allan noted in 1995 (appendix B7.15.3). As described in section 11.2.1, for much of the early 1990s Coalition politicians also regarded high levels of recycling as evidence of successful waste management policy.

Recycling was further called into question by sections of the environment movement in the early 1990s, when the improving availability of figures broken down to local government area for quantities recycled and quantities sent to landfill enabled the Waste Crisis Network to point out that the local government areas which had been congratulated for their recycling performance were also those with the highest per capita amounts of waste being sent to landfill (section 11.2.1).

9.2.3 Paper Recycling

The experience with paper recycling in the late 1980s and early 1990s provides an exemplary illustration of how the web of economic relationships involved in a profitable industry such as paper production resists policy intervention by governments.

As early as 1975, Pausacker (1978:14-15) had identified the main difficulties in implementing recycling programs for paper. Firstly, the paper mills were situated close to the sources of virgin fibre, and not the sources of waste paper, the capital cities. Secondly, the paper mills could not use waste paper without substantial modification. Thirdly, waste paper was a less reliable and more variable source of supply than virgin fibre from the plantations owned by the paper mills. Fourthly, technological innovation in the packaging industry was resulting in a proliferation of composites of paper and other materials such as plastics, which made recycling technically difficult. Fifthly, manufacturers of

paper products other than packaging believed that recycled content would lower the quality or appeal of their products (Pausacker, 1978:14-15). Added to these was the problem, identified by the Joint Select Committee on Waste Management in 1993, that the New South Wales Government could not simply mandate a particular recycled content in paper as this would be a restriction on interstate trade that would contravene Section 92 of the Australian Constitution (appendix B9.3.1:21). Finally, a further problem that emerged in the 1990s was that New South Wales's rate-pegging laws prevented local government from raising garbage rates so as to increase payments to firms collecting waste paper when prices were low.

Given the many good reasons for paper manufacturers not to substitute virgin fibre with waste paper, the collapse in prices for waste paper in the late 1980s as more households began separating newspapers from household rubbish (appendix B9.3.1:2) could have been anticipated. With the high levels of environmental concern amongst the public at this time, it would appear that both the paper industry and the Government were aware of the consequences of failing to take some form of action to overcome the problem. The State Government smoothed the path for the establishment of new paper mills to use waste paper (appendix B9.3.1:6, 11), while the paper industry formed the Publishers' National Environment Bureau to provide financial support to the recycling industry (appendix B9.3.1:9). However, the slowness of the industry in establishing new paper mills led to threats of newspaper boycotts from the environmental movement (appendix B9.3.1:8, 16), while the continuing low prices for waste paper led to the firms which were collecting and selling waste paper to threaten terminating kerbside collection unless a subsidy was provided (appendix B9.3.1:12, 15). Such subsidy was contrary to the ideology of the Coalition Government, with the result that it resisted any assistance until one day before kerbside collection was to be terminated (appendix B9.3.1:18).

With the characteristic volatility of markets for recyclables, by 1995 prices had risen substantially, with the *Herald* reporting a shortage of waste paper (appendix B9.3.1:23).

9.2.4 Plastics Recycling

Plants for using recycled plastic were not established in New South Wales until 1991 (appendix B9.3.2:1-4). In the case of polyethylene teraphthalate (PET), it would appear that the nature of the process for using recycled PET in packaging (which could accommodate a maximum of 30 per cent recycled PET) led inevitably to an oversupply of PET (appendix B9.3.2:4, 5, 8, 9) and falling prices. The achievement of a 30 per cent recycling rate was regarded with enthusiasm by the Australian Conservation Foundation as 'closing the loop' (appendix B9.3.2:5), but was seen as a cynical public relations exercise by Friends of the Earth (appendix B9.3.2:4).

9.2.5 Kerbside Collection

While kerbside collection as an approach to recycling had been introduced by at least one council in the mid-1970s (appendix B9.3.3:1), it was not until the late 1980s and the early 1990s that the State Government began to provide incentives to encourage kerbside collection initiatives by councils (appendix B9.3.3:5, 6, 8), as well as canvassing the possibilities for punishing those councils that did not introduce kerbside collection (appendix B9.3.3:10, 11).

As mentioned in section 11.2.1, the recycling rates achieved by kerbside collection were regarded as an indicator of the success of the Government's waste management policy. However in 1994 and 1995 growing criticism of both recycling in general and kerbside collection began to emerge, both from environmental groups (see section 11.2.1) and economists (appendix B9.3.3:18). The former, and the *Herald* in late 1994 (appendix B9.3.3:17), pointed out that high levels of recycling did not necessarily translate into a reduction of waste going to landfill, while the latter questioned the environmental and economic benefits of kerbside collection (appendix B9.3.3:18).

9.2.6 Recycling Symbolism

The growth of recycling's symbolic meanings appears to have followed the growth of recycling itself, with limited evidence of such meanings prior to 1989 (appendix B9.3.4:1, 2), but a wealth of meaning appearing thereafter. Recycling was seen as:

- an environmental issue on which there was general consensus (appendix B9.3.4:3),

- a practical way for people to save the environment and demonstrate their support for environmental protection (similar to Ungar's 'small steps' discourse) (appendix B9.3.4:4, 8),

- a means of saving trees (appendix B9.3.4:6, 7), and

- a quasi-religious ritual (appendix B9.3:33; B9.3.4:10).

9.3 Packaging Levies and Container Deposits

Since 1972, governments from both sides of politics in New South Wales canvassed the possibility of introducing container deposit legislation or taxes or levies on packaging (appendix B9.4:1, 5-7, 11, 13, 16, 18). While the Labor Party appeared to give greater favour to such legislation in its election platform in 1995, once in government its approach to the legislation was little different to its Coalition predecessors (appendix B7.17.3:1). From the early 1970s to the early 1990s, container deposit legislation was consistently supported by environmental groups and vigorously opposed by the packaging industry (appendix B9.4:2, 4, 11,14, 16). The arguments for container deposit legislation prior to the 1990s related mainly to the need for industry to bear some of the public costs of waste disposal due to its packaging (appendix B7.17.3:5, 6). However, in the 1990s, the arguments in favour covered a wider range which, if anything, made the justification more uncertain than when it was in moral terms of responsibility for waste disposal. The report of the Joint Select Committee on Waste Management in 1993 set out a number of the arguments that had been put to the Committee, noting that container deposit legislation was 'one of the most actively argued issues before the Committee'. Environmental groups put forward the following arguments in favour of container deposit legislation:

- it would involve manufacturers in taking 'cradle to grave' responsibility for their products,

- it would provide and incentive for the public to return containers,

- refillable containers had less environmental impact than non-returnable containers as they reduced materials and energy usage by the beverage industry,

- it would reduce litter,

- it could broaden the range of containers being refilled beyond the beverage industry, and

- three thousand new jobs would be created in the handling and sorting of returned containers.

Beverage and retail industry representatives argued that:

- beverage containers constituted only two per cent of the waste stream going into landfill,

- non-returnable glass containers were 30 per cent lighter than refillable ones and therefore used less materials and energy in their manufacture and less energy in transport,

- refillable bottles required water for washing,

- the caustic solution used for washing was a potential source of pollution,

- residues of the caustic solution in bottles might be a health risk,

- supermarkets did not have the space or staff to store returned bottles,

- returned bottles stored in supermarkets could be a health hazard,

- the financial viability of kerbside recycling would be threatened,

- kerbside recycling was already covering most types of containers and the levels of recycling were increasing, and

- more jobs would be lost in the glass production and recycling industries that would be created under container deposit legislation.

Friends of the Earth countered the industry argument by claiming that washing used less water than manufacture of new bottles and that only a mild caustic solution was required and it could be re-used (JSCWM, 1993:44-46).
There were also conflicting accounts over the period from the 1970s to the 1990s as to whether container deposit legislation increased recycling rates, with environmental groups arguing that it did and industry groups denying this (appendix B9.4:4, 14, 19).

9.4 The Packaging Industry and Recycling

From the sources available to this study, there appears to be strong evidence that the packaging industry has, from the early 1970s, sought to resist and deflect government policies aimed at encouraging the industry to take greater responsibility for its products in the post-consumer phase. While such resistance has generally been interpreted as a form of environmental immorality by the environmental movement, there is little doubt that the policies that have been proposed, such as container deposit legislation and packaging levies, would impose additional costs on the industry. For companies that had structured themselves with backward vertical integration to ensure certainty in the supply of raw materials (for example, the paper industry's ownership of pine plantations), the pressure for recycling threatened the closure of whole subsidiary companies (appendix B9.5:5).

There were a range of defensive strategies pursued by the industry. In the early 1970s, some firms obviously hoped that the interest in recycling was a passing phase (perhaps more a non-strategy than a strategy) (appendix B9.5:7).

From the 1970s to the 1990s, the packaging industry formed a number of industry associations (often with words such as 'environment' in their title) the function of which was either to lobby governments and/or undertake research on recycling and litter (appendix B9.5:3, 4, 10, 13, 14). The research undertaken by, or funded by, these associations has largely been situated in economics (see, for example, the Business Regulation Review Unit study described in section 7.3) or behavioural psychology or behavioural descriptions in which the focus is

on the individual's household recycling behaviour or littering behaviour in public spaces (see, for example, the Beverage Industry Environment Council, 1999 and the Litter and Recycling Research Association, 1995, respectively). Given that in economic studies it is generally far easier to quantify the costs to industry than the benefits to the environment, such studies are generally favourable to industry's case against interventionist government policies. Studies on littering focus attention away from the industry's role in creating the packaging and on to individual acts of civic misdemeanour (appendix B9.5:2, 6, 11, 12; Reeve, Ramasubramanian and McNeill, 2000). The industry also promoted incineration (energy recovery) as an alternative to recycling (appendix B9.5:15), and this was reflected in its version of the waste management hierarchy (see section 11.3.1).

In the opinion of the environmental movement, the packaging industry also engaged in a number of deceptive practices to deflect criticism (appendix B9.5:3, 6, 15, 16).

10. SOCIAL MOVEMENTS AND WASTE

Environmental and other community organisations have taken an interest in waste issues in Sydney since at least the 1930s and their influence on waste management policy has been mentioned at various points in the preceding chapters. This chapter provides some additional background on these groups and their engagement with waste issues. With the *Herald* as the main source for this description and the fact that waste issues were not a major concern for most groups, it is inevitably somewhat disjointed. While in no sense providing an account of the development of environmental organisations in Sydney , it does identify the points of contact between the organisations and the waste issues that are central to this study. A more complete account of the development of environmental organisations in Sydney is given by Hutton and Connors (1999), although they present very little material on waste issues.

10.1 The Parks and Playgrounds Movement

While the State Government had taken a role in the late 19th and early 20th century in preserving areas on Sydney's outskirts (such as Royal National Park and Kuringai Chase), the Local Government Act of 1919 placed responsibilities on local government for the provision of parks and other open recreational spaces within the urban part of Sydney. Prior to this, parks had comprised areas of sandy wasteland that were unsuitable for any other use, such as Moore Park and Centennial Park, or were reclaimed areas of wetland, such as Wentworth and Birchgrove Parks (Cuneen, 1980:110). The Act required that councils, in approving subdivisions, give consideration to the amount of recreational space provided. This gave those who were dissatisfied with the amount or distribution of recreational space in Sydney the opportunity to press councils for improvements, although the view had already been put prior to this that Sydney was in need of more parks in some areas.

For example, Joseph Henry Maiden, a botanist known today for his extensive work describing and classifying the flora of Australia, drew attention to the inequitable distribution of parks and recreational space in Sydney in a paper to the Royal Society of New South Wales in 1902. In an article for the *Sydney Morning Herald* in 1905, Maiden argued that there was a need to ensure that recreational space was not lost to buildings (Cuneen, 1980:110). In 1914, a Parks Preservation Society was formed, however from Cuneen's account, this group appears not to have had any influence on subsequent events relating to recreational space in Sydney.

In 1930, the Parks and Playgrounds Movement (PPM) was founded by Dr C.E.W. Bean, initially as an offshoot of the Town Planning Association. The PPM had a mainly middle class professional membership and in 1932 published a study of Sydney's recreational space needs (Cuneen, 1980:111, 112). The Parks and Playgrounds Movement both promoted increased recreational space, and acted as a watchdog that lobbied governments whenever parks or other recreational spaces appeared to be under threat of replacement with another landuse. Membership of the Movement dwindled in the 1970s, with many of its members, such as Myles Dunphy, joining the increasing number of conservation organisations (Cuneen, 1980:114).

The views of the Parks and Playgrounds Movement appear to have made some impact, at least, on the members of the Legislative Assembly and were brought into the debates about beach pollution in the early 1930s (see section 7.1).

> *Dr C.E.W. Bean, speaking at the Health Week conference said that we should begin a systematic campaign for the preservation of our playing areas. I maintain that the greatest playing areas the city of Sydney are her beaches, and than it is our duty to prevent the pollution of them that is taking place at the present time.*
>
> (Legislative Assembly, 13.10.32:1069)

> *Our beaches are the playground not only of Australians but of many persons from the other side of the world. In times of stress like the present they are the playground of the poor, who spend their days there. Surfing is building up a type of young man the physique of whom is not surpassed by that of men of any other country in the world. Our life-savers are equal to any in the world. Reference was made to the importance of physical culture for children in our schools, but they can have no better physical culture than they can get on the beaches.*
>
> (Legislative Assembly, 13.10.32:1069)

10.2 The Total Environment Centre and Friends of the Earth in the 1970s

The Total Environment Centre (TEC) was founded in late March, 1972. Those involved in setting it up included Professor E.P. George of the School of Physics at UNSW, Anthony Strachan, president of the Civic Design Society, Maurice May, a solicitor, Terry Quantrill, a businessman, and R.D. Walshe, a publisher. The first director was Milo Dunphy. The TEC saw its role as providing information to the public generally and to assemble expert panels at short notice for specific projects. Dunphy listed the TEC's aims as:

- specific environmental campaigns,
- helping small groups to gain the support of institutions or political parties,
- building links between existing environmental organisations,
- forming expert panels (SMH, 21.3.72).

The *Herald* reported in August 1972 that the while the original intention of the TEC had been to counter the sense of individual helplessness people felt about environmental issues, it had been 'deluged' with enquiries from 'furious' citizens with a 'sense of aggressive militancy'. Also reported was that TEC members had been suffering harassment in the form of poison pen letters and hundreds of dollars of unordered goods being sent to them. (SMH, 19.8.72:20)

In October 1975, Jeff Angel, the coordinator of the Centre, described it as both a support group (providing advice, information, administrative services, equipment and meeting rooms) and an activist group (holding rallies, writing letters, collecting signatures for petitions and physically preventing objectionable developments). He was careful to emphasise that the Centre did not 'take the banner out of the local's hands' (Angel, 1975:1).

The Friends of the Earth first appeared in the pages of the *Herald* in relation to waste issues in January 1977, when they claimed that the Woronora River may have been contaminated by radioactive waste from the Lucas Heights nuclear reactor. It was having tests done by the NSW Institute of Technology and announced it would clean up rubbish at a popular swimming hole just

downstream from Lucas Heights to draw attention to the dangers of nuclear energy (SMH, 15.1.77:4).

However, on the day of the clean up, any symbolic links to nuclear energy were forgotten in a confrontation that provided the *Herald* photographer with the opportunity to highlight on the front page a stark cultural contrast. The Friends of the Earth members had collected a large pile of rubbish which spilled onto an access road to the picnic spot on the Woronora River. According to the *Herald:*

> *...when Mr Reg Bird, of Carlingford, tried to drive past, he judged the space too small and drove into the pile.*
>
> *'I've been waiting for an hour to get out.' he said. 'The Friends of the Earth have caused more trouble than they're worth.'*
>
> *The Friends protested that there had been enough room for him to pass.*
>
> *Nearly 40 other picnickers joined the argument on Mr Bird's side and flung cans and bottles back into the bush, shattering some on the rocks.*
>
> *'They must be mad collecting rubbish,' one picnicker said. 'If they'd left it were it was, we wouldn't have noticed it.'*
>
> (SMH, 17.1.77:1)

The *Herald* photographs highlight the confrontation of cultures, with a group of young and middle-aged working class Sydney-siders in thongs and swimming attire, some over-weight, and with beer cans in hand, facing the young Friends of the Earth members, in their jeans and tee-shirts with campaign buttons affixed.

The actions of the Friends of the Earth were subsequently praised by the Shire Clerk of Sutherland Shire, while the Atomic Energy Commission insisted that any radio-active releases were within the limits negotiated with the State Government (SMH, 18.1.77:8).

In December 1977, the Total Environment Centre and the NSW Environment Centre each received grants of $7500 from the NSW Government. The ACF received $5000 (SMH, 20.12.77:3).

10.3 Involvement in Policy Making in the 1980s

While there appears to have been some differentiation since the early 1970s between environmental groups in Sydney along the spectrum from activist groups aiming to mobilise public opinion by activism outside the policy process to groups who saw their roles as information providers and wished to work within the policy process, this differentiation appeared to become more pronounced in the 1980s. The issue of hazardous chemicals and high temperature incineration was one area where this differentiation was readily apparent.

In November 1985, the visiting Executive Director of the US Centre for the Defence of Free Enterprise told a conference of the Agricultural and Veterinary Chemicals Association of Australia that 'Anti-chemical activists are a social and political pest. They attack and infect public opinion and public policy'. These and other extreme claims provided an opportunity for a spokesperson for the toxic and hazardous chemical committee of the Total Environment Centre, Dr Kate Short, to take a more moderate stance, saying that the statements were 'irresponsible, coming at a time when environmentalists and industry members were working towards better control of the use of chemicals in rural and urban areas' (SMH, 6.11.85:7) — a rare reversal of the usual pattern of industry claims to the high moral ground of moderation and responsibility against the indignant clamour of environmentalists.

By the late 1980s, the split in the environmental movement over high temperature incineration had become clear. Greenpeace had announced in 1987 that it did not support high temperature incinerators because they encouraged industry to continue producing hazardous wastes (SMH, 17.3.87:5). High temperature incineration was also opposed by Friends of the Earth, while the Toxic and Hazardous Chemicals Committee of the Total Environment Centre and ACF supported it, on the provision that it was used only in the short term to dispose of the stockpile of accumulated intractable waste (Legislative Council, 18.4.89:6500, 6503).

Greenpeace continued its opposition to high temperature incineration, criticising the proposed Corowa incinerator in 1990 on the grounds that the technology would result in unacceptable levels of pollution and that safer alternatives would become available in the future. In an editorial the *Herald*

condemned Greenpeace for 'playing on fears and whipping up hysteria' in relation to the Corowa incinerator proposal (SMH, 27.9.90:12).

10.4 A More Substantial Role in the 1990s

As depicted in figures B6.1 and B6.2, 1989, marked the transition point between a declining number of articles in the *Herald* about toxic chemicals and waste, and an increasing number of articles about solid waste. There seems to have been a similar transition in the interest of the environmental movement in waste issues from hazardous waste to solid waste, particularly after the threat of a high temperature incinerator had receded in the early 1990s (it is possible, of course, that this shift of emphasis is more a reflection of the *Herald*'s choice of news stories, in that when the *Herald* was reporting on hazardous waste, it sought reactions from environmental groups on hazardous waste issues, and similarly when it was reporting on solid waste).

In 1989, Friends of the Earth made a submission to the Government calling on it to revamp the New South Wales Recycling Committee (Legislative Assembly, 4.4.89:5796), an initiative that was later proposed in the Coalition Government's Green Paper on Waste Management (Hartcher, 1992:37)

The Total Environment Centre ran a waste management conference in 1992 with speakers from various Sydney environmental groups and from local government. The address by David Hughes of the Nature Conservation Council speculated that the State Government and the Waste Management Authority had:

> *...a hidden agenda to create the crisis so that waste corporations could pick up the profits at the end. ... I am extremely disturbed that the inability of Sydney to follow the emerging international path of waste minimisation, at source separation and control, recycling and waste avoidance, is in some way linked to the agenda of the major private waste management organisations to capture this lucrative market under the impetus of the ideological preconceptions of the New Right and its so-called market forces-led efficiencies.*
>
> (Hughes 1992:2-3, emphasis in original)

Hughes cautioned against the effects of private sector monopolies in the waste industries and argued that Sydney's environmental organisations had on their files 'much of the theoretical and practical fabric for a waste management and minimisation strategy ' for Sydney (Hughes, 1992:3). This was borne out by the

Friends of the Earth waste management strategies appended to the published conference proceedings.

It is also interesting to note that Hughes was able adroitly to deflect any of the negative connotations of selfishness associated with the obvious nimbyism of the opposition to the Londonderry and Lucas Heights mega-landfill proposals by conceptually expanding the backyard from a local to global one.

> *... unless that community itself acts to either minimise or eliminate the creation of* [toxic] *waste, unless it deals with it locally, the very dangerous materials created will be disposed of in someone else's backyard.*
>
> *Even if those backyards are elsewhere overseas and possibly in Third World countries, the toxic by-products of our lifestyles will still remain a problem for us as not only is the world a global village, it is also a global backyard and, ultimately, there is no escaping the problem.*
>
> (Hughes, 1992:1)

At the same conference Herbert Beauchamp (1992:36), of the Total Environment Centre Toxics Committee, called for the NSW Government to:

- halt any further privatisation of waste management,
- instruct the Waste Management Authority to produce management plans for a 40 per cent reduction of waste in two years and 60 per cent in five years,
- introduce container deposit legislation, including for plastic containers,
- require the building industry to deconstruct rather than demolish buildings,
- introduce effective waste education programs,
- allow local government joint responsibility for expenditure of funds generated by waste management charges, and
- encourage local government to accept four regional high temperature incinerators.

The waste reduction achievements in Seattle were cited to justify the feasibility of the proposed targets. It was also argued that there was a need to 'come to terms with a bogey of the past — incineration' and that with developments in incinerator technology dioxin and heavy metal emissions were no longer a problem (Beauchamp, 1992:35-36). On the other hand, mega-landfills were still a problem, with 'leaking tips, river pollution and hundreds of heavy trucks per day' (p.31).

Perhaps the most substantial influence by the environmental movement on waste policy in the 1990s came from the loose coalition known as the Waste Management Network or the Waste Crisis Network. The Waste Management Network was described in an appendix to the proceedings of the conference described above as comprising representatives of about 20 environmental groups, including all the peak groups. Its goal was to develop a joint policy on waste management for all the environmental groups. The contact person was given as David Hughes of the Nature Conservation Council (Anon, 1992:37).

The first mention of the Waste Crisis Network in the *Herald* was in a waste management feature in May 1993. The Network was described as a 'group of 30 green agencies and community groups', with Peter Hopper as secretary and John Denlay as chairperson, the latter being also the waste minimisation officer with the Friends of the Earth (SMH, 31.5.93:18).

The Waste Crisis Network was important in broadening the range of options under consideration in the waste debate of the early 1990s, and increasing the depth of explanation for the waste issues it considered to be of concern. The report produced by Peter Hopper in December 1992 for Friends of the Earth (Hopper, 1992) was significant in this latter respect for drawing attention to structural change, both in the beverage industry and in retailing generally, as the cause of the increase in non-returnable beverage packaging. Hopper presented figures showing that between 1974 the number of soft drink companies in New South Wales had fallen from 135 to 27. Over the same period, production in the New South Wales beverage industry had increased by 51.7 per cent, while employment fell by 53.7 per cent. The root cause of these changes was the emergence of the supermarket as the dominant form of retailing of groceries.

In early 1995, John Denlay (described as a 'leading waste management consultant' in the *Herald)* prepared for the Sutherland Shire Council an

alternative waste management strategy, described in a report titled 'Wasted Time: Sydney's Solid Waste Crisis'.

The strategy included a number of novel suggestions which appeared not have been canvassed to that date (at least in the *Herald*), as well as standard approaches to waste management:

- reuse and repair centres,
- recycling,
- centralised composting of organics,
- separation of toxic substances from the waste stream,
- non-toxic, non-biodegradable materials baled and landfilled, and
- improved industrial design to avoid waste.

The report suggested that if the toxic substances in products could not be recovered or reused, then the products should not be made and that more space could be created in existing landfills if they were 'mined' for their toxic and recyclable materials. Denlay claimed that his strategy could reduce Sydney's waste to landfill by 90 per cent and strongly argued for a single authority that was a partnership between the Local Government Association and the State Government. A spokesperson for the Minister for the Environment rejected Denlay's claim that the State Government had no waste planning policy through having transferred its responsibilities to local government. To the contrary, the State Government was working with councils and had negotiated with the LGA on waste issues, and with industry bodies to sign waste agreements (SMH, 6.2.95:4).

A concept that appears to have entered the 1990s waste debate through the agency of the Friends of the Earth and the Waste Crisis Network was extended producer responsibility, the view that manufacturers should take some responsibility for the recycling or disposal of their products at the end of their useful life, regardless of the fact that ownership of the product rests with the consumer.

The first mention of extended producer responsibility appears to be in the criticism of the National Waste Minimisation and Recycling Strategy by the spokesperson for Friends of the Earth, David Vincent, reported by the *Herald* at the time of the launch of the Strategy in Sydney in June 1992. He referred to German legislation which 'held manufacturers responsible for collecting and recycling containers' and argued that this was consistent with the 'polluter pays' principle (SMH, 23.6.92:10).

The Waste Crisis Network raised the issue of extended producer responsibility in October 1994, when, according to the *Herald*, it argued that 'Legislation is needed to put the responsibility on industry to take back its products and recycle them' (SMH, 22.10.94:13).

In March 1995, John Denlay, speaking as waste campaigner for Friends of the Earth, made quite clear that producer responsibility included financial responsibility 'We need especially to make manufacturers pay the costs of waste they generate so they have an incentive to keep packaging to a minimum' (SMH, 30.3.95:39).

The 'producer responsibility' found its way into the 1995 Labor waste reforms as the Producer Responsibility Scheme (B7.16.3:8), even if the Scheme was not strictly extended producer responsibility as defined above. There was, however, little doubt among the Coalition Opposition that the Friends of the Earth had influence (undue influence in the Coalition's opinion) on the Government:

> *Previously people have come straight out of the community into the Minister's office to give advice to the Government — people such as Peter Hopper and John Denlay from the Friends of the Earth and Peter Wood from the Local Government Association.*
>
> (Legislative Council, 15.12.95:5049)

11. RUBBISH REFLEXIVITY AND THE ROLE OF SCIENCE

Scientific and engineering expertise is required both for the creation of the products that ultimately become waste and for the management of this waste. The application of expertise to the problems of leachate control in landfills and the treatment of liquid industrial waste brought about significant environmental improvements since the 1970s. The application of scientific and engineering expertise to these areas was generally uncontentious and did not enter waste policy debate, and so has been given only the briefest of descriptions in chapter 6 and appendix B5.

There are, however, a number of areas where the application of scientific expertise did enter policy debate, either as support for particular points of view, or through providing principles and concepts around which debate was structured. As waste management in Sydney became more sophisticated and better controlled by the MWDA, there was improved understanding of the waste stream and its relationship with the level of affluence in the suburbs that generated it.

It is these aspects that are the subject of this chapter.

11.1 Contentious and Emblematic Packaging

11.1.1 Plastic Packaging

Plastic packaging was singled out as a waste problem as early as 1973:

> *I believe one of the biggest of these* [the community's solid waste problems] *is the disposal of plastic containers. It is reported that in the United States of America more than 3 billion tons of plastic containers are discarded each year. Most of them end up in local tips and dumps, building up mountains of non-rotting, non-rusting trash.*
>
> (Legislative Council, 15.8.73:181-182)

(see also appendix B6.2:8)

Plastic shopping bags were identified as part of the over-packaging problem by a member of the Legislative Assembly in April 1985:

> *Supermarket commodities are sometimes wrapped in two, three or four different types of packaging material. The checkout operator then puts them in a plastic bag. Not only is that material difficult to dispose of, but the hidden cost of it must be paid for by the consumer.*
>
> (Legislative Assembly, 11.4.85:5895)

Plastic was once again singled out as a cause of waste problems in March 1986:

> *Changes in types of packaging towards plastic products, increasing the volume of waste and non-biodegradability of disposable materials make the problem of waste disposal much worse.*
>
> (Legislative Assembly, 12.3.86:868)

The first article on the refusal of plastic bags at point of purchase appeared in the *Herald* in June 1989. It was reported that Coles public relations controller was hoping that Coles would be using photodegradable bags soon. Paper bags were rejected because of the use of trees, while USA EPA research that biodegradable plastic resulted in undesirable soil leaching was cited as a reason for not using biodegradable plastic (SMH, 22.6.89:19).

Early in 1990, KMART introduced a scheme by which they made a donation of two cents to local charities and the Australian Trust for Conservation Volunteers for each customer who refused a plastic bag. The KMART public relations spokesperson was reported as saying that KMART'S research had

identified two themes that were of concern to their customers in relation to the environment. These were the customers' perceived inability to do anything individually that would make a difference to environmental problems and their concern about the volume of plastic entering the waste stream (SMH, 8.10.90:16).

In October 1990, the *Herald* ran an article comparing the merits of plastic and paper shopping bags. Acknowledging that green groups had convinced many that 'taking plastic grocery bags from stores is a mortal sin', the article referred to the Plastics Industry Association claim, supported by scientific studies, that plastic bag manufacture consumed 20-40 per cent less energy than paper bag manufacture and produced less carbon dioxide. Against this was set the pulp and paper industry's claim that paper bags were made from renewable resources and had up to 50 per cent recycled content, compared to the 0.5 per cent of plastic that was being recycled at that time. The journalist's own contribution to the article was a paragraph on uncontrollable nature of plastic bags.

> *There is no getting around the fact that plastic bags, unlike paper bags, don't bio-degrade. They find their way into the litter stream and stay there — at best into landfill, at worst into storm water drains, on to beaches, into rivers, streams and everywhere else from Antarctica to the Amazon.*
>
> (SMH, 8.10.90:16)

A similar disagreement arose about this time over the relative environmental merits of polystyrene and paper packaging. In November 1990, McDonalds announced it was phasing out foam packaging and replacing it with paper and cardboard with recycled content. The USA president of McDonalds was quoted as saying: 'Although some scientific studies indicate that foam packaging is environmentally sound, our customers just don't feel good about it.' The Australian managing director was reported as saying that he fully expected to be criticised for using materials produced from trees once the change to paper packaging was made (SMH, 3.11.90:5).

In November 1991, the *Herald* published an in-depth article on the relative merits of polystyrene and paper packaging. Quoting an article from New Scientist that reported on a study that showed that a paper cup used more resources to produce than a polystyrene cup, the *Herald* article concluded that it was very difficult to make environmental assessments about the merits of packaging materials. Confusion among consumers was considered to be rife and this was attributed to the maturing of the debate about packaging in which

the industry had the time to come up with studies countering the claims of the environmental movement. Coles was reported as having no immediate plans to replace polystyrene trays, while McDonalds was well advanced in phasing out polystyrene (SMH, 20.11.91:21).

The November article was supported by a further article in April 1992 reporting the views of a visiting Canadian professor of chemistry at the University of NSW. In addition to the higher level of resource use, he noted that while paper and polystyrene cups initially took up the same amount of space in a landfill, the paper cup would form methane, a powerful greenhouse gas, if it decomposed under anaerobic conditions (SMH, 7.4.92:2).

In March 1992, the Hon. Patricia Forsythe, MLC, criticised the Leader of the Opposition in the Legislative Assembly over his comments that consumers should refuse to take packaging away from supermarkets with them. Quoting extensively from Puplick and Nicholls (1992), a publication by the Packaging Environment Foundation of Australia, she drew attention to the figures in the publication which purported to show that packaging actually reduced the volume of waste. This argument turned on the point that householders preparing fresh food, such as home-squeezed orange juice, or cooked poultry, discarded more food scraps into the municipal waste stream than did householders who bought the same product already prepared, and simply discarded the packaging into the waste stream. For processed food, much of the unused portions, such as orange peel, were used in manufacturing other products, so that the amount of waste was far less than in the householder's kitchen (Legislative Council, 6.3.92:732-733).

In July 1993, Greenpeace successfully halted the shipment by Woolworths of 9000 kg of plastic bags to Asia, accusing Woolworths of dumping its waste problems on the Third World. Woolworths said it was cheaper to recycle the bags in overseas countries than in Melbourne (SMH, 15.7.93:2).

In the aftermath of the tabling of the Waste Minimisation and Management Bill, the idea of rejection of packaging at point of sale re-emerged. According to an article on recycling in the *Herald* in late November 1995, 'the basic message [of the new approach embodied by the legislation] if it's not packaged responsibly, then reject it' (SMH, 30.11.95:13).

11.1.2 Biodegradable Plastic

In August 1973, 'Additive X' was mentioned in the Legislative Council as a recent discovery which, if added to plastic during its manufacture, would cause it to be broken down by enzymes when it came into contact with the soil (Legislative Council, 15.8.73:182).

In 1978, Pausacker claimed in his study of recycling in Australia at that time that research into accelerated decomposition of plastics was a 'ludicrous exercise', given the impact of such an innovation in retailing where products might be stored for longer than anticipated. He concluded for this reason that such research was little more than a public relations exercise (Pausacker, 1978:38-39).

In August 1987, ICI Australia announced a new biodegradable polymer, Biopol, which was produced by bacteria and a sugar or starch feedstock rather from a fossil fuel (SMH, 10.8.87:7).

In July 1989, Cut Price Deli announced it would be introducing Ecolyte photo-degradable plastic bags that break down in about 60 days. The General Manager was reported as saying that although the photo-degradable bags were more expensive, the firm believed it had an obligation to operate in an environmentally aware and responsible manner (SMH, 17.7.89:4). The Minister for the Environment, Tim Moore was reported as being in favour of the production and distribution of the bags, which were to be used by Coles. However, the SPCC expressed reservations, claiming that the bags would encourage greater use of plastic. The Opposition environment spokesperson, Pam Allan, pointed out that the bags would still cause problems because they might not degrade if they ended up out of the light, such as in landfills or in deep water. The independent member for Swansea wrote to Tim Moore requesting a moratorium on the manufacture of the bags until an environmental study could be carried out. The managing director of a large plastic manufacturing firm near Newcastle was quoted as saying that there was no evidence that the photo-degradable film would continue to degrade in darkness after a few days exposure to light, and that the bags would put an end of the plastic recycling industry, responsible for recycling 30 000 tonnes of plastic each year (SMH, 21.7.89:4).

In October 1989, the *Herald* carried an article criticising photo-degradable plastic bags. A chemist and packaging expert with CSIRO claimed that these bags made no contribution to solving the problem of plastic wastes in landfills. Where bags were exposed to sufficient sunlight and oxygen, they would break down as claimed, but this would mean that if all of the two billion check-out bags used in Australia each year broke down in this way, this would contribute 30 000 tonnes of carbon dioxide to the atmosphere. But if the bags did not receive sufficient sunlight, then they would be stable for many years. The CSIRO chemist also advised against using the bags for food as the chemicals released as the plastic degrades could contaminate food. He argued that photo-degradable bags should not be introduced — rather, polyethylene bags should be recycled or burnt as fuel (SMH, 10.10.89:1).

11.1.3 Milk Bottles and Containers

In October 1989, the *Herald* reported that, due to the efforts of the environmental movement, there had been slight increases in the demand for milk in bottles. It quoted a milk supplier to shops who said that whenever there was an environmental program on television, there would be an increase in bottled milk sales in the following days. A spokesperson for the Total Environment Centre was quoted as claiming that bottles were more environmentally sound because they used a plentiful resource, the manufacturing process was relatively clean and they could be re-used many times (SMH, 11.10.89:3).

In November 1989, the Friends of the Earth staged a 'National Milk Bottle Day' on which they asked purchasers of milk to buy only in bottles. The *Herald* article reporting the Day, presented graphs from figures provided by the NSW Dairy Corporation showing that, in the period 1984-85 to 1988-89, one litre cartons and 600 ml bottles had a declining share of milk sales, while the share of two litre plastic bottles had increased from 15 per cent to 55 per cent. A spokesperson for Tetra Pak, a manufacturer of cartons claimed that bottles were undesirable because light could reduce the vitamin content of the milk, because bottles required greater use of transport, and because milk would be more expensive if cartons were replaced by bottles. A spokesperson for ACI, a glass manufacturer, replied that no one would leave their milk out in the sun, and that the high prices quoted for the Canberra trial of one litre glass bottles was due to the small volume of bottles involved. This spokesperson rejected Tetra

Pak's claim that glass bottles could leave flakes of glass in the milk, pointing out that dioxin could leach from cardboard into milk, a claim that was countered by Tetra Pak which had changed its supplier of cardboard to mills that did not use chlorine bleaching. Friends of the Earth reiterated its call for a deposit on milk bottles to improve the return rate, a scheme that it claimed had been opposed by the packaging industry for many years (SMH, 23.11.89:3).

In February 1990, it was reported that, according to the Friends of the Earth, sales of bottled milk had increased by 30 per cent since the previous November when it began the campaign. This was denied by a dairy industry spokesperson. The Friends of the Earth spokesperson, Peter Hopper, maintained that glass bottles enabled savings in the use of resources and energy and should be used more widely, while the managing director of Australian Cooperative Foods was reported as disputing the merits of glass, mentioning that plans were under way to recycle plastic containers (SMH, 20.4.90:3).

The glass versus plastics debate surfaced at a meeting of the Royal Australian Chemical Institute at the University of New South Wales in May 1990. A technical adviser with the plastics producer, Hoechst Australia, argued that plastic containers were cleaner and more energy efficient to produce, compared to glass. Paper bags used a lot of energy and gave off harmful residues in their manufacture, while string bags were undesirable because they were made from pesticide-treated cotton plants. The technical adviser also claimed that fourteen times as much carbon dioxide was given off in the manufacture of a glass bottle, compared to a plastic bottle of the same capacity. The industry construction of litter as a people problem was also deployed: 'Plastic doesn't cause rubbish; it's people not disposing of it as thoughtfully as they might. Why not burn it instead of burying it?'. The technical adviser pointed out that plastic had two and a half times the calorific value of brown coal and burning was widely used overseas to generate steam and electricity. A Friends of the Earth spokesperson, replying to the claims for the *Herald*, argued that 'the re-useable nature of string bags and glass packaging outweighed any environmental hazards in their production'. The spokesperson also pointed to the release of highly toxic vinyl chloride monomers during plastics manufacture, while a CSIRO packaging expert drew attention to the production of toxic and corrosive substances when PVC was burnt (SMH, 24.5.90:5).

In March 1992, the *Herald* reported New Zealand research which showed that exposure to light in two litre plastic container resulted in a decrease in the

vitamin content and a change in the taste compared to milk in cardboard cartons (SMH, 18.3.92:6).

In September 1992, an article on the phasing out of milk that was not homogenised brought up the bottle versus carton issue. A person who preferred the non-homogenised milk was quoted as saying 'I have to believe that anything [such as bottles] that can be used up to 27 times is better'. The article went on to report that 'The first principle of many environmentalists is that re-use is preferable to recycling', thus making bottles preferable to cartons. The general manager of the milk division of Australian Consolidated Foods was quoted as saying that the disadvantage of the bottles was the cost and pollution caused by washing (SMH, 19.9.92:2). Several days after the *Herald* article, the issue was raised by Democrat MLC, the Hon. Richard Jones, in the Legislative Council (Legislative Council, 23.9.92:6257).

The milk bottle debate was reactivated in the aftermath of the tabling of the Waste Minimisation and Management Bill in November 1995. Conservation groups rallied outside Parliament House on 16 November to protest about a decision by Australian Cooperative Foods to phase out milk bottles, The Labor Minister for Agriculture, Mr Amery, claimed that the company had taken this action because the Government did not grant it the full milk price rise it had requested (Legislative Assembly, 16.11.95:3413). In early December 1995, the managing director of Australian Cooperative Foods was reported by the *Herald* as confirming that milk bottles would be phased out by Christmas because they were uneconomic to produce. According to a spokesperson for the Minister for the Environment, an amendment to the legislation was likely to be passed in the Legislative Council to compel the industry to retain a fraction of sales of milk in glass bottles (see appendix B6.17.4) The managing director was unabashed:

> *That would be interesting, wouldn't it? If the Government wants to legislate, are they going to force people to drink a pint of milk a day from glass bottles? We'll wait with interest to see what people are going to force us to do.*
>
> (SMH, 2.12.95:8)

According to the *Herald*, he also pointed out that consumer demand for bottles had fallen from nine per cent of the market four years previously to three per cent of the market, and that milk bottles were being used only five times instead of twenty-five times because they were not being returned (SMH, 2.12.95:8).

11.2 Rubbish Reflexivity

In November 1988, the *Herald* published the first of what might be termed reflexive waste articles. The article described the relationship between waste generation and socio-economic status and location in Sydney. The article used per head waste generation rates and reported on the view of the MWDA that the larger 240 litre bins and the bans on backyard burning were responsible for the increasing waste generation rate (SMH, 22.11.88:4).

The introduction in January 1991 of the Council Recycling Rebate Scheme by the Waste Management Authority, which paid rebates to councils according to the quantities of domestic recyclables they collected, resulted in improved figures about recycling rates across Sydney's local government areas (WMA, 1990-91:20).

11.2.1 The Suburban Recycling Competition

In March 1991, the *Herald* published local government area recycling participation rates, showing high participation rates in the northern suburbs and low rates in the south west. The findings came from a survey by Recycle Sydney, an organisation formed by the Glass Packaging Institute and the Litter Research Association in 1990. The manager of Recycle Sydney was reported as saying that the State Government should offer greater incentives to local government to provide weekly collections (which were shown to have a higher participation rate than monthly collections) (SMH, 12.3.91:2).

In June 1991, the *Herald* published the kg recycled per person per year figures for all Sydney Councils, based on a survey by the WMA. The figures showed higher rates in the northern and eastern suburbs (SMH, 4.6.91:5). The results of this survey in December showed that some of the southern suburbs had improved (SMH, 18.12.91:7).

In March 1992, the Minister for the Environment, Tim Moore, commended the member for Manly for his council 'coming in second or third in per capita recycling returns' (Legislative Assembly, 19.3.92:1467). Also at this time, Moore announced that just under 100 000 tonnes of recyclables had been diverted from the waste stream during 1991 under the Council Recycling Rebate Scheme. He used the per capita recycling rates calculated for each local government area to

praise the northern and eastern suburbs where the rates were high, and the relative low rate in Sutherland Shire to chide the Liberal member for Sutherland to whose question he was responding (Legislative Assembly, 10.3.92:828).

The quarterly recycling survey results were published by the *Herald* in June 1992 without the usual table of per capita recycling rates for each local government area. The article drew attention as usual to the differences in the rates between the northern and eastern suburbs and the inner southern and western suburbs. Tim Moore was quoted as saying he hoped the councils would compete with each other to be at the top of the recycling table (SMH, 10.6.92:2).

In September 1992, in announcing the release of the Waste Management Green Paper, the Minister for the Environment, Chris Hartcher, referred to the excellent records on recycling of some councils and accused Liverpool Council, which had the lowest recycling rate, and other Labor controlled councils of 'drag[ging] the chain badly on recycling (Legislative Assembly, 24.9.92:6492).

In October 1992, after eighteen months of published recycling figures in the *Herald* and of self-congratulatory articles about the progress being made with recycling, the Nature Conservation Council pointed out that the councils that were being rewarded with the greatest amount of recycling rebate, i.e. those collecting the most recyclables, were also those who were throwing away the most non-recyclables and therefore making the greatest contribution to the shortage of landfill space. According to the Nature Conservation Council project officer, Peter Hopper, the kerbside recycling scheme was rewarding those in the affluent suburbs who were producing the most waste, and therefore encouraging the production of waste for landfill disposal rather than reducing it. The argument was supported by the Independent member for Manly who said that although Manly had one of the best recycling records in Sydney, it had only reduced its waste stream by 10 per cent (SMH, 30.10.92:3).

In February 1994, the *Herald* raised the claims of the Nature Conservation Council and its associate, the Waste Crisis Network once again, the claims having been published in the 'Waste Crisis Quarterly' (a publication of the Nature Conservation Council with a title similar to the EPA's 'Kerbside Quarterly' which published success stories about kerbside recycling) The 'Waste Crisis Quarterly' also claimed that the average reduction in waste going to landfill as a consequence of kerbside collection was only 2.4 per cent between

1992 and 1993 which did not augur well for the target of 50 per cent reduction by 2000. Peter Hopper was quoted by the *Herald* as saying that the focus placed on recycling by government and industry was 'a serious distraction from the real issue of 'waste avoidance' and that legislation to promote waste reduction and reuse was urgently required. A spokesperson for the Minister of the Environment, however, cast doubt on the significance of the report's findings, pointing out that it considered only household waste, which was only about one half of the total volume going to landfill (SMH, 2.2.94:5). On the other hand, given that it was the industry contribution which had increased most rapidly in the late 1980s, and industry waste management that had received relative little policy attention over the preceding decades, it was hardly likely that industry recycling initiatives would improve the figure suggested by Hopper.

It appears that the discrediting of recycling did not immediately discourage political support for it. In May 1994, the Minister for the Environment, Chris Hartcher, was still congratulating northern suburbs Liberal councils for being 'at the top of the performers' list [on recycling rates]' (Legislative Assembly, 4.5.94:1887).

The embarrassment suffered by the Government as a consequence of the Nature Conservation Council's discrediting of recycling rates as a measure of waste management performance was recounted by the newly elected Labor member for Badgery's Creek in December 1995:

> *The previous Government had a lovely document called 'Kerbside Quarterly'. I am sure the member for Pittwater remembers 'Kerbside Quarterly', which stated how wonderful councils were at recycling. The honourable member said a lot about how councils met their targets. The last column in that publication was about how much was thrown away per capita for everybody that lived in a local government area. The waste crisis network realised that all the great performers in recycling were really lousy performers when it came to reducing waste, that they threw away more waste than people in western Sydney. So what happened to the last column? It disappeared; it was not printed. People started saying that this was a furphy, a shonk, that the people in Penrith throw away half as much as the people on the North Shore. Yet the people of Penrith were told that they were lousy recyclers.*
>
> (Legislative Assembly, 5.12.95:4143)

Informant 5 corroborated this account of the Government's embarrassment, suggesting that the annoyance at the Nature Conservation Council's action was more due the action 'shifting the spotlight' away from recycling, on which the

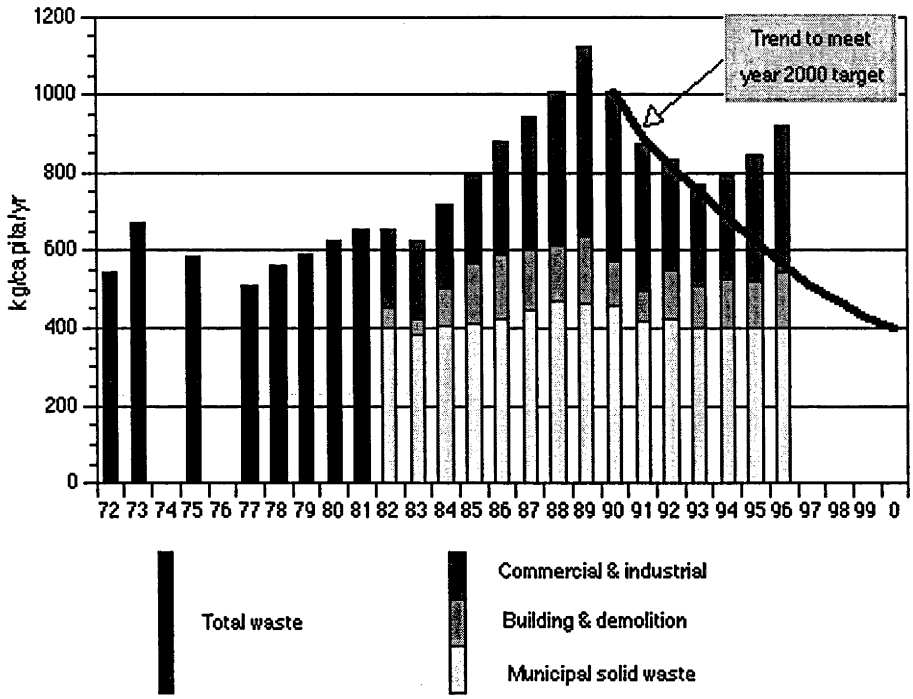
Government was depending as demonstration of its progress in dealing with the waste crisis, to reduction in consumption (see Figure 11.3 (b)), which was the environmental movement's favoured approach.

11.2.2 The Per Capita Slide

There was a tendency in the early 1990s for per capita figures to be used in a particular style of writing about the quantities of waste to be disposed of. This style frequently resulted in a slide of meaning from quoted total waste disposal weights per capita, to the idea that each person actually discarded that amount of waste. For example, the Authority wrote in its 1989-90 annual report: 'In 1989, 3.7 million tonnes of solid waste were disposed of in metropolitan Sydney; more than 1 tonne for every man, woman and child' (WMA, 1989-90:18). Similarly, in the 1991-92 report, 'At present, the amount of solid waste we throw away, while falling, is still, on average, 870 kilograms a year for each one of us' (WRAPS, 1991-92:6). Reference to figure 11.1 will make it clear that 'we' in this statement has to include industry and commerce. While the per capita figure is correct, there is a slide of meaning, implying that each person actually disposed of this much waste. This is incorrect as approximately one half of the total solid waste going to landfill in Sydney (which excludes agricultural and mining wastes which are generated outside of Sydney) was generated by industry and commerce.

In May 1993, per capita waste generation rates were completely misconstrued in a *Herald* special waste feature. An article framing events as a waste crisis assumed that the per capita rates were what individuals actually discarded. Following the headline, 'Waste Mountains' the article commenced: 'Our average family of four dispatches the equivalent of 13 220 kg Sumo wrestlers [i.e. 13 Sumo wrestlers each weighing 220kg, amounting to 2860 kg per family or about 715 kg per person] a year to the rubbish dump' (SMH, 31.5.93:18). Inspection of figure 11.1 would suggest that this figure includes commercial and industrial waste and building and demolition waste. In actual fact, the average family of four would send somewhat over one half of the amount cited by the *Herald*.

Figure 11.1: Trends in per capita per annum generation of solid waste requiring disposal. This excludes generation of waste which is collected for recycling, Prior to 1982, only data for the total amount of solid waste are available. (Source: data supplied by NSW Environmental Protection Authority Waste Branch.)



A similar misconstrual occurred in a *Herald* article in March 1994 (appendix B6.11:2) and in the *Herald* in a waste management feature in March 1995: 'Sydneysiders each dispose of 774 kg of garbage a year' (SMH, 30.3.95:39). In November 1995, the introduction to an article on recycling referred to 'one of Sydney's most pressing political and environmental problems — the household rubbish bin', thereby ignoring the half of the problem that was due to industrial waste (SMH, 30.11.95:13).

11.2.3 Doubts about the Target

At the Land and Environment Court hearing in October 1994 into the rejection by Penrith Council of Pacific Waste Managements application to extend its landfill at Badgery's Creek to take putrescible waste, the possibility was raised that the amount of waste going to landfill each year was being underestimated by 1.3 million tonnes (see Waste Industry, below), compared to an estimated total of about two million tonnes per year (SMH, 17.10.94:4; 18.10.94:12).

By August 1995, it was becoming clear that the amount of waste going to landfill was being systematically under-reported. In its first discussion paper, the Government Pricing Tribunal confirmed the claims that had been raised in the Land and Environment Court hearing The discussion paper claimed that one million tonnes of waste, about one third of that going into landfills, was not registered in official figures due to contractors dumping illegally at landfills to avoid paying a $7.20 per tonne environmental levy. If this was allowed for, then the current figure for the volume of waste going to landfill was higher than the 1990 figure which was the benchmark for the target reduction in waste. Also in August 1995, the *Herald* reported on Melbourne University research which claimed that the official national figure of 14 million tonnes per year to landfill for the eight capital cities was closer to 22 million tonnes per year, due to illegal dumping and poor policing by regulatory agencies (SMH, 23.8.95:2).

Several months later, waste targets came under criticism in an inquiry by the Federal Government's Industry Commission. The commissioner of the inquiry was cited by the *Herald* as criticising the setting of targets in the National Waste Minimisation and Recycling Strategy as:

- 'generating hidden economic costs which ultimately had to be passed on to ratepayers and consumers',

- being set without 'clear environmental objectives or ... a clear understanding of the likely environmental and economic benefits and costs', and

- having 'perverse effects on incentives and on the policies of packaging waste management'.

The 50 per cent waste reduction target was singled out as having been 'adopted with poor information about the amount of waste going to landfill at the time' (SMH, 23.10.95:2). This view was corroborated by informant 1, an officer within the Waste Section of the Commonwealth Environment Protection Authority.

11.3 Waste Representations, Principles and Story-Lines

11.3.1 The Waste Management Hierarchy

As described in appendix B2.3, the waste management hierarchy and its triangular diagram can be traced back to the Second Environmental Action Programme (1977-81) of the European Union. The Minister for Local Government, Mr Jensen, was quoted by the *Herald* on 21.12.77 as saying that 'disposal should only be a last resort', a view that is consistent with the concept of the waste hierarchy.

In the case of the top step of the hierarchy, the Authority appears to have first publicly acknowledged the possibility of waste reduction as a policy objective in its 1985-86 annual report:

> *Throughout the world there has been a growing awareness at the community level of resource recovery and waste reduction as significant issues. Waste management policies are increasingly being viewed in terms of national environmental objectives with the following priorities:*
>
> - *Waste reduction*
> - *Separation at source for recycling*
> - *Mechanical separation of useful materials*
> - *Energy recovery*
> - *Landfill*
>
> (MWDA, 1985-86:44)

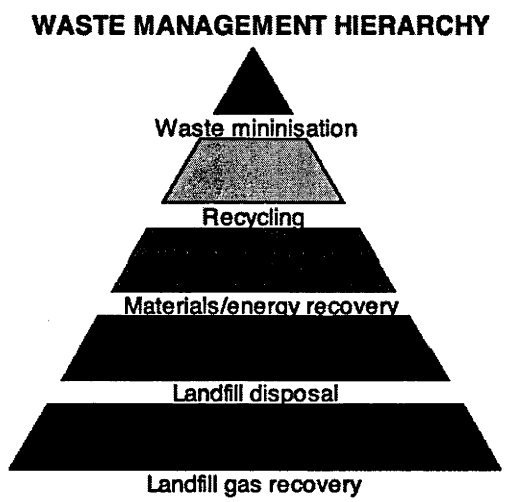
While not specifically stating that the first mentioned objective had the highest priority, such an ordering is very similar to the waste hierarchy. In noting that 'local circumstances and economic factors will, of course, dictate the order of those priorities [in the hierarchy]' (MWDA, 1985-86:44), the Authority clearly subscribed to the 'menu of options' school. This term was used by Schall (1992:1) to describe the view of the waste hierarchy as options any of which may be preferable under appropriate economic and environmental circumstances. The Authority appeared to remain committed to this school during the late 1980s (see, for example, MWDA, 1988-89:31).

In 1989-90, the Waste Management Authority (WMA) explicitly cited the waste management hierarchy as something around which its waste management strategies would be based. According to the Chairperson of the Board and the Managing Director:

> *This hierarchy prioritises waste reduction programs as our primary environmental objectives. The Authority has adopted a role of encouraging and facilitating increased levels of waste reduction by industry, councils, Government and the community.*
>
> (WMA, 1989-90:3)

In the main part of the annual report, the hierarchy was described as: '... a sequentially integrated approach to waste management which gives primary concern to waste minimisation and recycling (WMA 1989-90:9). The diagram shown in figure 11.2 appeared adjacent to both of the above descriptions of the waste management hierarchy.

Figure 11.2: The waste management hierarchy (Source: WMA, 1989-90:3, 9 — grey tones may differ slightly from original).



The account of the waste management hierarchy given in the 1989-90 annual report represents a switch, at least publicly, from the 'menu of options' school to the 'hierarchy of options' school as Schall (1992:1) terms it.

A question that arises about the presentation of the waste management hierarchy in the annual reports of the Authority is whether the hierarchy was a serious guiding principle for the waste management professionals of the Authority, or presented in the annual reports merely to show an up-to-date and impressive public face. According to informant 4, the hierarchy was regarded as a guiding principle by the professionals of the Authority. Much of the comment received on the 1990 Sydney Waste Management Strategy was framed in terms of the hierarchy. Informant 4 believed that the Authority had 'brought the hierarchy to Australia' and reported that the Coalition Environment

Minister, Tim Moore, viewed the hierarchy as a means of thinking about the distribution of waste management authority, viz. that the EPA should deal with the top of the hierarchy, while the Authority should deal with the bottom.

The hierarchy made its first appearance in the Legislative Assembly in April 1989. The Labor member for Wallsend, Mr Mills, presented his maiden speech in the debate on the Waste Disposal (Amendment) Bill and made what appears to be the explicit reference to the waste hierarchy in the Assembly, although the concept of placing greater priority on minimisation and recycling had already been put forward by the Labor spokesperson on the environment earlier in the same debate.

> *The Organization of Economic Co-operation and Development hierarchy of management of toxic wastes deserves some reflection also in the light of these amendments. ... The Opposition is committed to the higher priorities in that hierarchy. I hope that this Government is also so committed.*
>
> (Legislative Assembly, 4.4.89:5805)

In the Green Paper the waste management hierarchy was represented as a menu of options dependent on the dictates of the market (B7.7.2:3). In 'No Time to Waste' the waste management hierarchy was both a true hierarchy in the statement of policy principles (B7.12.2:3) and a menu of options for waste planning (B7.12.3:3). In the majority report of the Joint Select Committee, the different interest groups positioned themselves in the waste management debate through the use of different versions of the waste management hierarchy (figure 11.3).

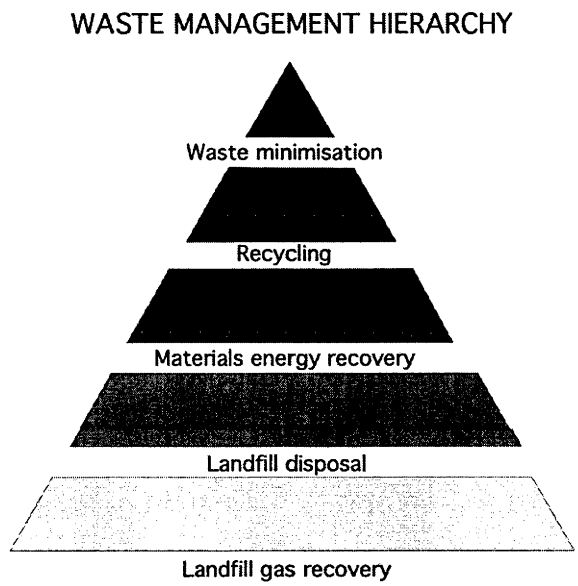
Government and industry versions of the hierarchy placed emphasis in the achievement of the 50 per cent waste reduction target on the diversion of materials from landfill through recycling, while the Nature Conservation and Local Government Reference Group diagrams emphasised reduction at source (figure 11.2 (b), (d)) (appendix B6.8.3:3-6).

While various waste management options were mentioned in groups in the *Herald* during 1990 to 1993, it was not until May 1993, that these articles conveyed the sense that these options could somehow constitute a prescriptive principle for action. In a waste management feature, an article stated that: 'Environmental groups say that the first two components of the 'three Rs' — reduce and reuse — have been largely ignored in the rush towards recycling' (SMH, 31.5.93:19).

In the Labor Government's 'Waste Reforms' the hierarchy was a true hierarchy in the statement of policy principles, but with the triangular diagram inverted (figure 11.4) (appendix B6.16.2:1) . However, in introducing the Waste Minimisation and Management Bill, the Government described an approach to industry waste reduction plans that was very like a menu of options (appendix B6.16.2:3).

Figure 11.3: Versions of the waste management hierarchy presented in the majority report of the Joint Select Committee on Waste Management.

(a) The Green Paper version



(b) The Nature Conservation Reference Group version.

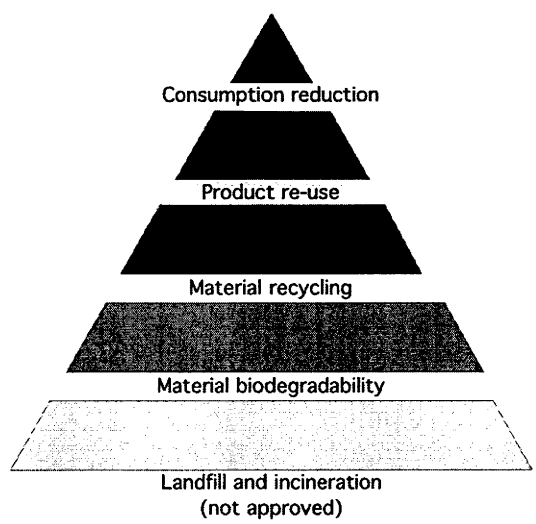
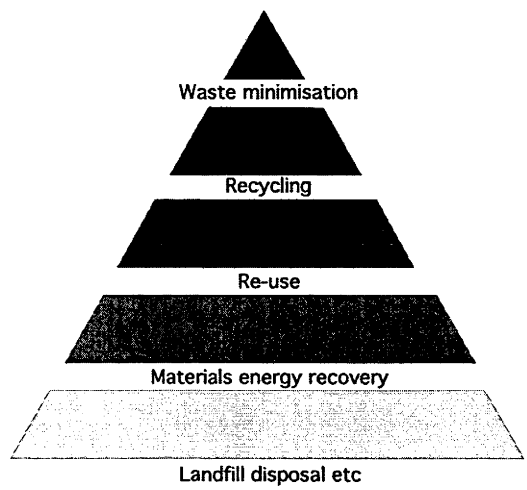


Figure 11.3(contd): Versions of the waste management hierarchy presented in the majority report of the Joint Select Committee on Waste Management.

(c) The Industry and Recycling Reference Group version.



(d) The Local Government Reference Group version.

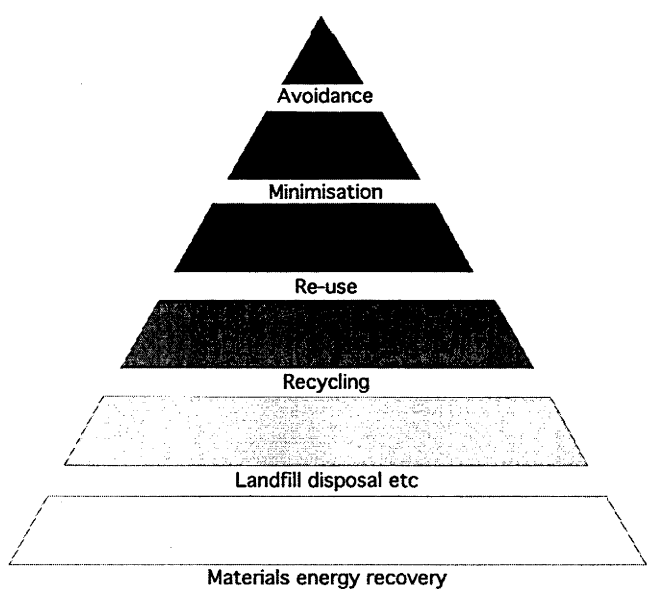
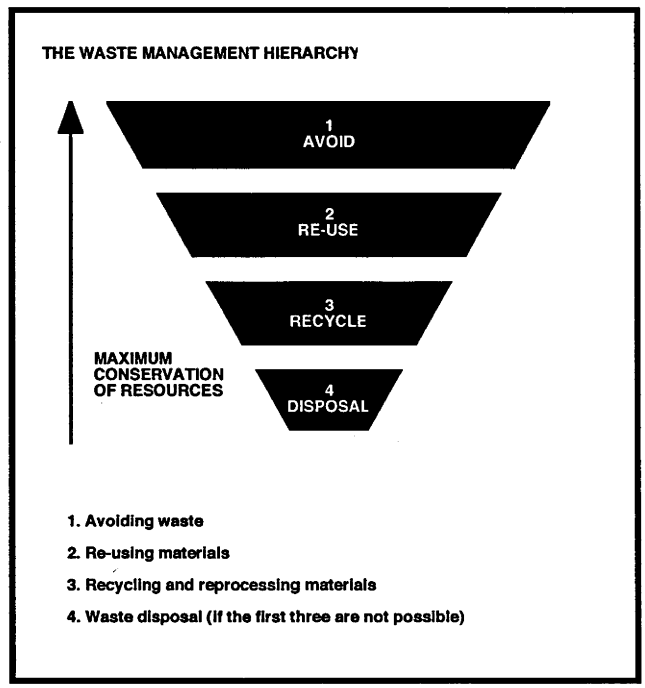


Figure 11.4: Version of the waste management hierarchy presented in the Labor Government's waste policy document of 1995, 'Waste Reforms'.



However, at this time, the packaging industry was promoting the 'menu of options' interpretation of the waste hierarchy, arguing in its submission to the Senate Standing Committee on Environment, Recreation and Arts that waste management policy should be based on consideration of all available options and a mix of solutions chosen which would optimise economic and environmental outcomes (Senate Standing Committee on Environment, Recreation and Arts, 1994:14).

While the waste management hierarchy was a fundamental principle in the Waste Minimisation and Management Act 1995, as had been the case for the previous five years, the merit of the hierarchy was taken as self evident. According to informant 8, this unquestioning acceptance of the merit of the principle extended to the section within the NSW EPA with policy and regulatory responsibilities under the Act.

11.3.2 Environmental Symbolism

Towards the end of the 1980s, there was a distinct change in how waste was related to environmental issues, being particularly noticeable in the annual reporting of the MWDA. It commenced in 1986-87, with the justification for recycling, which had been given for many years previously as conserving natural resources, being widened to include conserving landfill space (MWDA, 1986.87:37). In 1987-88, recycling was mentioned as a means of reducing the waste stream (MWDA, 1987-88:13).

Then, in 1988-89, the introductory paragraphs to the Director's review, left little doubt that the Authority was operating in a new set of conditions, although this particular annual report marked the first in a new format and the first for the new Director (see section 5.1):

> *In the past year environmental issues have sprung to the forefront of the minds of the entire community. It is now clearer than ever before that our environment is our most valuable resource and that its capacity to absorb humanity's waste products is far from limitless. Its fragile nature is now clearly evident as a result of the recent focus on issues such as the greenhouse effect, ozone depletion and beach pollution.*
>
> (MWDA, 1988-89:2)

Compared to the Director's reviews in the past, such reference to the environmental issues of the day was novel subject matter. The Review went on to note that waste management was 'in crisis' in some parts of the developed world and extrapolated the current waste generation trends to show that 100 million tonnes of waste would be generated by 2011, ' a pile of garbage which would fill Sydney Harbour'.

The linking of waste management to the apocalyptic dimensions of global climatic change was more specific in the year's review in the 1989-90 annual report:

> *The recent dramatic increase in the environmental awareness of the community continues to grow and is not likely to wane as we approach the 21st century.*
>
> *This concern has been precipitated by issues such as ozone depletion and the greenhouse effect. However, it has also focussed the community's attention on waste management issues in general...*
>
> (WMA, 1989-90:3)

The review went on to describe the responses of the New South Wales Government to this community concern, suggesting that 'this change recognises that the environment is at risk unless community wastes can be reduced substantially' (WMA, 1989-90:3). This statement is difficult to reconcile with the previous 18 years of MWDA research and development that had gone into reducing the environmental impacts of its landfills to an extremely low level. Indeed, the detailed accounts of the Authority's achievements in this area which had occupied up to several pages in previous annual reports were reduced to several short paragraphs in the 1989-90 annual report.

About this time, landfill capacity, at Castlereagh and elsewhere began to be represented as a precious finite resource (appendix B5.5.2:45), a representation that also occurred in the Green Paper (appendix B6.7.1:2) in 1993.

11.3.3 The Construction of Crisis

In 1990-91, the Waste Management Authority was operating under crisis conditions, with a major reorganisation under the Protection of the Environment Administration Act 1991 looming before it, with the Government decision not to proceed with the Londonderry landfill and to place a moratorium on further landfills, and with delays in the siting of a high temperature incinerator due to intense public opposition. It is interesting to note, that under these conditions, the Authority's account of its twenty years of operation presented its origins in terms of a crisis.

> *Crisis*
>
> *1970 Local Government closes their mostly open dumps to the acceptance of industrial liquid wastes because of mounting environmental problems and community concern. Great concern arises as the possibility of waste transporters dumping liquid wastes into sewers, rivers and in bushland.*
>
> *A proliferation of local dumps have become an environmental and operational nightmare. Fires, vermin infested piles of uncovered rotting garbage and leachate polluted streams and rivers are common. The Government of the Day calls for an independent report by Mr A.E. Barton, a representative of the British Government on Toxic Waste Disposal.*
>
> (WMA, 1990-91:8)

As discussed in section 4.7.6, there is little evidence in the *Herald* for widespread public concern about the liquid waste 'crisis' of 1969 and 1970, and the impetus for the appointment of Alan Barton came originally from an

approach to the NSW Department of Decentralisation and Development by a number of liquid waste transporting firms, requesting the provision of an area of land where they could dispose of liquid wastes.

In 1991-92, the newly formed Waste Recycling and Processing Service (WRAPS or the Waste Service), wrote of changes in community attitudes in terms of 'as people get further away from the disasters of the early 1970s' (WRAPS, 1991-92:14).

11.3.4 Life Cycle Analysis

In September 1992, life cycle analysis was put forward in the Legislative Assembly as a solution to making decisions about waste management:

> *I am concerned that we may jump to possible solutions with regard to our waste stream without a comprehensive analysis. ... The reality is that when it comes to waste management we are dealing with probably the most critical issue facing society today. ... New South Wales cannot hope to move to a comprehensive strategy unless we all recognise the importance of life cycle analysis for the various packaging options. ... In short, it is time to elevate discussion with regard to waste disposal from simplistic solutions, away from nostalgia, and to truly recognise and consider in depth all the issues for the sake of our society now and in the future. I hope the Minister will encourage a consideration of life cycle analysis, ...*
>
> (Legislative Assembly, 24.9.92:6529)

12. DISCUSSION

12.1 Introduction

In chapter 1, the research questions set for the study were:

- whether the formation and evolution of public policy for the management of solid waste in the city of Sydney in the period 1900-1996 was affected by changes in the understanding among the general populace of waste substances and waste places and, if so, in what way,

- whether waste policy making may sometimes be a form of moral panic over deviant matter,
- whether the various dualisms, binary codes and story lines that occur in waste policy discourse have a role in problem closure, policy formation and policy paralysis,
- how realist and structuralist accounts of waste policy formation and evolution might relate to each other, and
- whether Beckian and ecological modernist theories of long term change in environmental policy making are supported by the history of waste management in Sydney.

Also, as mentioned in section 2.8, it was anticipated that the compilation of the history of waste management could also lead via inductive reasoning to conjectures about explanations for waste management policy formation that lay outside the questions posed above.

The following sections set out in detail the conclusions that have been reached in respect of these questions, and the arguments that support those conclusions.

12.2 Dirt, Deviance and Danger

12.2.1 The Ambiguity and Deviance of Waste

From the sources used in the study, it is possible to discern two obvious ways in which waste has ambiguous qualities that defy the orderings and classifications of everyday life.

The first, which was pointed out by Douglas (1966), is ambiguity in the physical properties of substances that are regarded as waste. As described in section 8.8, there was little doubt in the minds of the focus group participants that the substances at the bottom of a landfill would have ambiguous properties somewhere between liquid and solid. The advertising professionals who provided the advertisements for the first Clean Up the Harbour Campaign in 1989 (with the 'Yukky Yukky Poo' jingle) connected, either intentionally or subconsciously, this innate dislike of ambiguous substances with the littered foreshores of the Harbour and global environmental problems (section 7.2.2).

Waste can also be spatially ambiguous, i.e. it defies the expected order of where certain types of things ought to be in our surroundings (matter out of place, as Douglas, 1966 noted). Things which are finished with and disposed of (thrown 'away'), cause concern if they continue to assert their presence by refusing to stay 'away'. This concern over spatial ambiguity appears most frequently in discussions of litter problems. The journalist describing the litter collected on Clean Up the Harbour day referred to plastic always turning up somewhere else (section 7.2.2). Parliamentarians have expressed their ire over McDonalds packaging by referring to its ability to appear at great distances from its source (appendix B6.17.4:5). Several focus group participants referred to plastic bags as blowing around and being 'everywhere' (section 8.8). Waste in landfills was also believed to have this unruly quality by one of the focus group participants (section 8.8).

There are, however, a number of other ambiguities associated with some of the constituents of waste, plastic in particular. The temporary usefulness of plastic packaging contrasts with its durability in the environment. A number of focus group participants raised concerns about plastic not breaking down, as did the journalist mentioned above (sections 8.8, 7.2.2). They also referred to the decomposition in landfills on a number of occasions as 'mutant', implying that the decomposition that took place in landfills would not be natural decomposition as in other places, due to the presence of plastic and poisons (section 8.8).

Plastic, then, is ambiguous in a number of ways. Indeed, with its refusal to decompose and its ability to return to haunt those who thought it had been thrown 'away', plastic realises the ancient folk fears of the unquiet dead. Added to this are some dangerous qualities such as the suffocations of children playing with plastic bags that occurred in the 1950s (appendix B4.1:2), the emission of hazardous fumes when it is burnt and past problems with plasticisers migrating into foodstuffs wrapped in plastic (section 8.7). It is perhaps not surprising then, that informant 3, a senior manager with an industry-sponsored litter reduction organisation, bemoaned what he regarded as the unfair share of attention plastic received as a scapegoat for modern ills. As Rathje and Murphy (1992) note of the USA:

> *Plastic is surrounded by a maelstrom of mythology; into the very word Americans seem to have distilled all of their guilt over the environmental degradation they have wrought and the culture of consumption they invented and inhabit.*
>
> Rathje and Murphy (1992:99)

12.2.2 Waste Places

As mentioned in section 2.2.2, Lynch (1990) introduced the idea of waste places as symbolically debased areas that signal the local relaxation of social control and attract litter and dumping. However, as touched on in section 2.2.4, the concept has a longer history, related to British colonial governments' classification of lands, both in Australia (Shelton, 1998) and in India (Hoeschele, 2000).

A number of sources located in this study suggest that both Sydney's ocean beaches, the dunes behind them, and other areas of heath and swamp land were regarded as waste lands in the 19th century, in that they were not perceived to have any immediate use (section 7.1.1). As sanitary standards improved in the 19th century, and waste began to be transported further afield, rather than being allowed to accumulate in the streets, it was these waste lands, together with the watery wastes of the ocean beyond the Heads, that received the garbage and night soil of the city (section 7.1.1).

There is also evidence that the mangrove fringed estuaries of the inner Harbour and other peripheral wetlands were viewed as waste land that was better converted to recreational space by filling with garbage and covering with soil, a practice that was recommended in the first half of the 20th century by both the Department of Health (appendix B8.1.3) and the Parks and Playground Movement (section 10.1).

By the late 1950s, the Health Department was beginning to have doubts about the wisdom of landfills in Harbour estuaries (appendices B7.4.3:1; B8.4:5), although in some local government circles such areas were still regarded as waste lands (appendix B8.3.1). By the mid-1970s, the issue of whether landfills in wetlands created recreational areas or destroyed areas suitable in their own right for other forms of recreation was being debated in the Legislative Assembly (appendix B6.1:12).

By the 1990s, the fringing beaches and wetlands of the Harbour had become the focus of massive community clean ups (section 7.2.2), and were certainly no longer regarded as suitable places for the accumulation of rubbish.

12.2.3 Out of Mind, Out of Sight

The popular saying 'out of sight, out of mind' was often encountered in the material examined as part of this study, including in academic literature, newspaper articles, parliamentary debate and inquiry and policy papers. The saying is often advanced as a simple rationalisation for any perceived failure of policy or individual behaviour in relation to waste management.

However, from the interpretations presented in the preceding sections, it would seem that 'out of mind, out of sight' might be an equally valid rationalisation. It could be argued that waste materials deposited in waste places do not excite concern among citizens — it is simply a case of material of no value resting in a place of no value. If this is the case, then it follows that concern might arise when there is a dissonance between the waste material and its place of accumulation. If the mind of the citizen is disturbed by this dissonance, to the extent that some form of remedial action is embarked upon, either physical or political, then it could be said that the waste has become visible. In other words, while the juxtaposition of waste and location is mentally unremarkable, it is effectively invisible. As the irate picnickers on the Woronora River in 1977 were reported by the *Herald* to have said as they threw the rubbish collected by the Friends of the Earth members back into the bush: "If they'd left it where it was, we wouldn't have noticed it." (section 10.2).

This suggests that concern about accumulations of waste might arise in two different ways, according to how the formerly unremarkable juxtaposition of material and location becomes visible, i.e.:

- a change in the way in which the place of accumulation is understood or used, or

- a change in the way in which the waste material itself is understood.

It would appear that several instances in which public concern about waste have arisen in Sydney may have had their origins in the types of changes above.

Change in the way in which places of accumulation of waste are understood seems to be at the root of the gradual contraction of suitable sites for depositing garbage in Sydney. The places of accumulation that underwent the most dramatic transformation were the ocean beaches and the dunes behind them.

The rapid rise in popularity of surfing in the early 20th century had elevated some beaches, such as Bondi and Manly, to the status of outdoor gymnasia that were essential to the vitality of the growing nation (section 7.1.1). The washing up of garbage on these beaches from ocean dumping by Sydney councils was unpleasant for bathers, as well as an affront to the growing symbolic meaning of the ocean beaches to Sydney (section 7.1.2).

A second example of the rise of concern about accumulations of waste due to a change in the way the place of accumulation is understood occurred in 1989. During much of the 1980s, concern had been expressed in the *Herald* and in Parliament about floating rubbish in the Harbour and Ian Kiernan, the instigator of Clean Up the Harbour had unsuccessfully attempted in late 1987 to interest the Government in a Clean Up Day, an idea that was not a novel one. However, a year later, Kiernan was able to mobilise a great deal of support from government and other sources, resulting in 20 000 volunteers turning out for the Clean Up (section 7.2.2). From the sources examined in this study, there appears to have been no startling scientific discoveries showing that the ecology of the Harbour was endangered by floating rubbish, nor were there reported any sudden increases in the amount of floating rubbish in the Harbour. There appear to be two things that lay behind the popular support for the Clean Up. Firstly, the Harbour had been the focus of year-long national bicentennial celebrations in 1988. Secondly, the problem of the greenhouse effect and ozone depletion had been receiving increasing political and media attention towards the end of the 1980s. The media reporting leading up to the Clean Up Day had placed the floating rubbish in stark contrast with the Harbour's symbolic importance as the birthplace of the nation, while the advertising for the Clean Up Day had provided an antidote against the vague concerns about possible global climatic catastrophe in the form of a simple action anyone could take (section 7.2.2). From both the media reports (section 7.2.2) and the focus group discussion (section 8.8.8), there is evidence that many people were motivated by beliefs about impending climatic catastrophe. The interesting thing about the Clean Up the Harbour example is the suggestion that a change *only* in the symbolic meanings attached to a place of accumulation of waste can result in the waste being seen as problematical.

It is also possible that changes in scientific understanding can lead to concern about accumulation of waste in particular locations. The change from what was termed in appendix B6.2:12 the 'old landfill logic' (landfills in wetlands improve recreational opportunity) to the 'new landfill logic' (landfills in

wetlands destroy recreational opportunities) in the period from the late 1950s (appendix B7.4.3:1) to the mid-1970s (appendix B6.2:12) was largely a consequence of the increasing scientific appreciation of the ecological importance of estuarine mangroves. As a result, garbage that had been resting in a waste area of smelly mangroves that bred sandflies and mosquitoes came to be resting instead in a crucial and highly productive part of estuarine ecosystems.

Turning now to the second way in which waste accumulations might come to be seen as problematical — changes in the way the waste itself is understood — there seems little doubt that, as touched upon in section 12.2.1 above, the appearance of plastic in the waste stream from the 1950s has had an impact on how waste is understood. Apart from the disquieting ambiguities of plastic mentioned in section 12.2.1, plastic and plastic packaging in particular, appears to have taken on a considerable range of symbolic meanings in the last fifty years. From at least since the early 1970s, plastic packaging, has come to symbolise the waste problem generally and its intractability (section 8.8.1; appendices B9.4.2:1, 3; B8.7:14; B6.2:8), the litter problem generally (section 7.2.2; appendix B7.2.6:25), the disappearance of the refillable milk bottle and the frugality values it represented (appendix B6.17.3:41-46), the disappearance of old-fashioned retailing (section 8.8.3) and the 'over-packaging problem' (appendix B9.4.2:2). This objectification into plastic packaging of concerns about waste generally, changing economic life and values was encountered from a wide range of actors, from the ordinary people of the focus groups through to Ministers of the Government.

From the sources available to this study, there appear to have been no comparable concerns or objectifications in the 19th century and early 20th century about particular constituents of waste. Sustained concern over several decades focussed on the ambiguous and dangerous qualities of a particular constituent of the waste stream, which comes to have a wide range of symbolic meanings attached to it, seems to be a phenomenon of the second half of the 20th century.

12.2.4 Waste and Danger

In section 2.2.4, the inference was drawn from the work of Hoy (1995) and others that the idea of invisible or near-invisible agents that carry dangers from

distant accumulations of waste has a long history, certainly back to times prior to the European settlement of New South Wales. The germ theory of disease at the end of the 19th century replaced one agent of danger (miasmas) with another (rats, flies, fleas, germs). In the 1900 plague outbreak, the logic behind the massive civic clean-up was guided by both the germ and miasmatic theories of disease (appendix B8.1.2). Throughout the first half of the 20th century in Sydney germs, rats and flies were the main agents of danger, although there is evidence that the role of the latter was exaggerated (appendix B7.4.2), as Hoy (1995) found in the USA.

A number of events in the 1970s led to public awareness of a new agent of danger. These included the world wide news coverage of Love Canal in the late 1970s, the local news coverage of the ongoing illegal dumping of liquid industrial waste in Sydney (section 8.6), the growing awareness of the potential for pollution of ground and surface waters by landfill leachates (appendix B5.2.1:1; section 8.6), and the publicity given to the discovery by the State Pollution Control Commission that 60 tonnes of dioxin contaminated waste had been dumped in three Sydney landfills in the early 1970s (section 8.6). Also in the 1970s, smoke from burning rubbish at landfills came to be considered as poisonous, rather than as a nuisance as it had been during the first half of the 20th century (section 8.1). This meant that landfills then had the capacity to endanger the health of people distant from them through the transport of dangerous and largely invisible chemicals via water or air.

With their invisibility, the agents of danger of the late 20th century have more in common with the miasmas of the 19th century, than with the biological agents of danger in the early 20th century. This is not to say that people in the late 20th are not unaware of the potential for harm transmitted by biological agents such as flies (appendix B8.1.3:15; section 8.8.4), rather the advent of the awareness of the possibility of toxic substances has added an additional and possibly more frightening agent of danger.

The third way, then, in which the concern of citizens might be aroused by accumulations of waste is changes in the agents of danger. While there is a continuity spanning the 19th and 20th century insofar as there always have been agents of danger that can make distant accumulations of waste seem problematical, the different agents of danger each open up their own possibilities, not only for remedial action by professionals and policy makers, but for the social construction of the dangers and their causes. As Fitzgerald, S.

(1992:215-216) notes, the cleansing of Sydney during the outbreak of bubonic plague related more to the location of 'problem' slums than to the actual incidence of plague cases (appendix B8.1.2:1). The advent of the germ theory of disease presented opportunities for the manufacturers of pesticides to prey on people's fears by exaggerating the dangers of flies (appendix B7.4.2:1). The possibility of hazardous chemicals in waste materials has given rise to such cultural and marketing productions as Teenage Mutant Ninja Turtles (and a wide range of other teenage heroes — Corcos, 1997), and the association between substances in landfills and mutation (section 8.8.9).

One instance where there may have been an increase in concern and policy change that is attributable to the advent of a new agent of danger was the abrupt change in policy that occurred with the death of a child from plague at Moore Park in 1900. In the context of a response to the plague outbreak that consisted mainly of slum cleaning in central Sydney rationalised with a mixture of miasmatic and germ theories of disease, the possibility that the accumulations of waste further out from the city centre could be nuclei for further spread of plague brought swift action that resulted in all of Sydney City Council's waste being dumped at sea (B8.1.2:3). However, the sources examined in this study do not make it clear whether this action by the Council was in response to the mobilisation of community concern, or to professional advice.

Turning to more recent times, the public concern about landfills in the early 1990s far exceeded that expressed about landfills or incinerators in the first half of the 20th century, to the extent that the coverage by the *Herald* and political debate can be taken as an indication. It might be argued that the greater coverage of environmental issues in the media, and increased public awareness of the mechanisms by which hazardous substances can circulate in the environment (e.g. Antarctic penguins carrying PCBs in their body fat) resulted in a growing perception that there was no refuge from the reach of the agents of danger. However, while it is difficult to point to a specific episode of public concern and consequent policy change that was solely due to the advent of these new late 20th century agents of danger, there is little doubt that they added to public fears of landfills, not only through fears of exposure to toxic substances, but also through fears of the 'mutant' substances that might form in modern landfills (section 8.8).

12.2.5 The 1990s Waste Crisis as a Moral Panic

In section 2.2.3, the conjecture was put forward that periods of heightened media and political attention to waste problems may be a form of moral panic, with deviant matter as the focus, rather than deviant groups within society. This turns on Douglas's characterisation of things that are regarded as dirty and polluting as falling between, or blurring, the categories by which daily experience is understood. The social groups that are the subject of moral panics, such as teenage mothers, homosexuals, Mods, or bikie gangs, generally defy classification in the normal categories by which other people in society are understood. As has been argued in section 2.2.2, and demonstrated by the focus group findings reported in section 8.8, some waste materials such as plastic and imagined substances in landfills similarly defy the categories by which materials are understood. Just as the bulk of the populace have little personal experience of the deviant groups that are the focus of moral panic, so do they also have little personal experience of such things as 'toxic waste'. Both are invisible threats, understood from the productions of culture more than from everyday life.

It might also be argued that deviant social groups are stigmatised as being 'dirty' in some sense, the conjecture being that dirty substances can give rise to moral panics in the same way that 'dirty' social groups do. However, an investigation of which social groups in Sydney may have been regarded as 'dirty' lies outside the scope of the thesis as defined in chapter 1, whereas the argument that appeals to Douglas's work is believed to be sufficient to establish the similarity between deviant materials and deviant social groups.

From the waste and litter policy making examined in this study, a number of observations can be made about this conjecture. There is little doubt that many of the features that have been described as characteristic of moral panics also apply to waste and litter policy making. Perhaps one of the clearest parallels is the role of the media in the early stages of a moral panic in creating the inventory of symbols and meanings which provide frames for subsequent reporting. For example, the reporting of hazardous waste issues during the 1980s created 'toxic waste' as a specific substance with its own set of dangerous qualities (section 8.6), when in fact there always had been a wide range of industrial waste products lying along a continuum from the mildly unpleasant to the life-threatening. The toxic waste frame was then used extensively in the reporting of the concerns of residents in the vicinity of the Castlereagh Depot

(section 5.5.2), fuelling the fears of those who did not understand the chemistry of liquid industrial wastes, and exasperating the Government in its search for a rational scientific assessment of the impacts of the Depot.

Another parallel is Cohen's (1972) 'not only this' phenomenon (representing the problem as the tip of an iceberg of social ills) which is readily discernible in the late 1980s and early 1990s, when Ian Kiernan's Clean Ups, recycling, and waste minimisation were all seen as solutions, not just to litter, excess packaging, or a shortage of landfill, but to the threat to survival posed by global environmental problems (section 7.2.2, appendix B9.3.4).

Goode and Ben-Yehuda (1994) and Thompson (1998) draw attention to the role of social movements in moral panics in emphasising the moral dimensions of the problem. One moral dimension pertaining to packaging waste is the principle of extended producer responsibility. This is an alternative way of framing the relationship between the packaging industry and its products when these have come to the end of their useful life. A simple commercial framing would see packaging as the property of the person who bought the product, and therefore of no concern of the manufacturer. The extended producer responsibility principle, on the other hand, seeks to establish manufacturers' moral responsibility for their products long after they have passed out of their ownership. Extended producer responsibility appears to have first been promoted during the 1990s waste crisis by the Friends of the Earth and the Waste Crisis Network (section 10.4). However, while the environmental movement had generally been responsible for feeding emerging ideas from overseas into the waste policy debate during the 1990s, there is evidence to suggest that this moral dimension of packaging waste has a longer history. For example, the substantial financial contributions since 1976 by the packaging industry to anti-littering programs are certainly promoted by the industry as an example of its responsible behaviour, even if it is the threat by government of container deposit legislation that makes the contributions so readily forthcoming.

Finally, it would be tempting to argue that the 1990s waste crisis arose, as moral panics are held to arise, at a time when, as Schudson (1989) argues, the symbols and meanings of the cultural repertoire fail to resonate with people's experience of reality. For example, it could be suggested that the 1970s and 1980s had provided a certain amount of reassurance that environmental problems were under control as pollution control technology became more effective during the

1970s, as development decisions came under the influence of environmental impact assessment in the late 1970s and as even the apparently irreconcilable conflict between economic development and environmental protection was ameliorated by the emergence of the concept of sustainable development in the mid-1980s. The sudden media publicity about global climate change and ozone holes that had occurred despite the reassurances of governments that the environment was being 'managed sustainably' may have represented a dissonance between past experience and reality. Certainly, both generalised measures of environmental concern and the *Herald*'s attention to waste issues rose dramatically in the late 1980s (figure B6.1),

However, it is probably none too difficult to propose some form of dissonance as Schudson envisages at any period in history. To demonstrate that the late 1980s was more significant in this respect than some other period would be a difficult undertaking, and certainly require a more thorough examination of environmental discourse than was undertaken in this study with its emphasis on waste issues.

In balance, the parallels between the 1990s waste crisis and the moral panics described by Cohen (1972), Thompson (1998) and others do not necessarily amount to a monopoly by moral panic theory on the explanation of waste policy making in times of crisis. Rather, moral panic theory deals with a particular type of policy making where the concerns that attract political attention are exceptionally well endowed with the sorts of meaning that lends itself to representation in media frames that command audience interest. Waste policy making could be thought of as occupying a position somewhere between policy making driven by moral panics and environmental policy making (such as industrial energy efficiency, for example) that lacks concerns that can readily be worked upon by the media to commence what Hall and Jefferson (1976) termed the signification spiral. Waste issues, and particularly litter issues, usually have a moral dimension to them (see, for example, appendices B6.2:6; B6.17.4:15; B7.2.3) and there is greater potential for bringing moral considerations to waste or litter issues than to something like industrial energy efficiency, but nowhere near the potential for moral explorations that can attend the concerns of classical moral panics about things like teenage pregnancies.

It is likely that moral panic theory may also apply to some other areas of environmental policy making, wherever materials being deposited in the environment, or the impacts of human activity on the environment have both

moral dimensions and an ambiguity or deviance that defies accommodation in existing systems of meaning, thereby encouraging media invention of new codes and symbols that capture public interest.

12.3 Reducing Complexity — Science, Simplifications and Stories

For most of Sydney's history, policy makers (from 19th century councillors to 1990s parliamentarians) have faced choices in what actions to take to deal with citizens' concerns about waste. From the earliest forms of local government, the available financial resources have fallen short of that needed for adequate waste management infrastructure, so that choices have always been complicated by the uncertainties in costing the options (section 4.3). From the late 19th century, the distribution of waste management functions between local government and the State Government has been contentious, with no universally acceptable principles on which a stable distribution of responsibility might be established and maintained (sections 4.4 and 4.5). Throughout much of the first half of the 20th century, the logic of economics favoured landfill or ocean dumping, while the logic of public health favoured incineration (section 7.1.2; appendix B8.1.3:1, 3). The early 20th century hopes of a single straightforward and mechanised solution to waste disposal through incineration faded with the burden of maintenance and replacement costs (section 8.2).

The post-war growth of material affluence took place in a city largely dependent on landfills scattered within its boundaries, one or more landfills in each local government area. Even for the MWDA in the 1970s, concerned mainly with ensuring there were enough landfills for the waste being generated and that waste disposal costs were kept to a minimum, the task of trading off landfill locations and short-haul and long-haul transport costs to arrive at a least cost distribution of inner transfer stations and peripheral regional landfills was a task of considerable complexity (section 5.2). With growing environmental concerns about municipal and industrial waste from the 1970s, with an increasing array of constituents in the waste stream, with increasing private sector involvement and with increasing public pressure for recycling and waste reduction, waste management for a city the size of Sydney had become an enormously complex enterprise by the 1990s.

Considering the position of waste management functions relative to the materials flow (from resources, mining, manufacture, consumption to disposal)

that is the foundation of modern industrial societies, it should come as no surprise that waste management faces major uncertainty in its *raison d'etre*, the waste stream. Almost any social, economic or technological change impacts on the nature or size of the waste stream. The breaking down of gendered division of household labour increases the amount of packaging in the municipal waste stream (Godbey *et al.*, 1998). Economic structural change in retailing led to the proliferation of non-returnable beverage containers, which had a significant impact on the waste stream (section 9.2.2). Growth of the rate of waste generation due to unanticipated causes beyond the control of the MWDA, such as the introduction by waste contractors of 240 litre wheeled bins (appendix B5.2.2:12) and the rapid growth in industrial solid waste with economic recovery in the late 1980s (section 5.2.3) were contributing factors to the 1990s waste crisis. Positioned at the receiving end of the waste stream, waste management generally has to make the most of whatever it is presented with at the end of the materials flow pipeline of the modern industrial economy.

Given the uncertainty associated with the waste stream, and the complexity of waste management, it might be expected that the media, politicians and interest groups involved in policy debate will have recourse to discursive devices such as simplifications, dualisms or binary codes and story-lines by which the complexity is rendered comprehensible and communicable. The following sections discuss the discursive devices which appeared most frequently in the sources examined in this study.

12.3.1 Bans

The banning by the state of certain actions by individuals is probably one of the oldest and simplest forms of social regulation. The local government ordinances that evolved during the 19th century to regulate waste management affairs were essentially a set of bans supported by punishments for contravention. Viewing the last 100 years of waste management in Sydney, it appears that bans were only seriously proposed in policy debates when the public was affronted by an undesirable set of circumstances. A ban on ocean dumping was seen as the solution to the beach pollution in the 1930s (sections 7.1.1, 7.1.2), although taking the garbage further out to sea might have prevented beach pollution *and* still been cheaper than incineration. During the waste crisis of the 1990s, the Coalition's Green Paper referred to the possibility of banning products that were 'entirely non-recyclable' (appendix B6.7.3:14),

the Joint Select Committee recommended the banning of garden waste from landfills (appendix B6.8.5:3), the Labor Party proposed banning incineration as part of its election campaign for the 1995 election (appendix B6.17.3) and the Waste Minimisation and Management Act allowed for product bans (appendix B6.17.4:23). Environmental groups also tended to place their demands in terms of bans, for example, calling for compostable waste to be banned from household garbage collection (appendix B6.11:3) and for some types of plastic packaging to be banned (appendix B7.2.6:25). A further parallel with moral panics can be seen in these calls for bans at times of heightened concern, insofar as Cohen (1972) argued that a consistent feature of moral panics was that specific principles were deduced from the general value believed to be under attack, and a method of control followed from consideration of the principle. For example, for beach pollution the principle deduced was that ocean dumping caused pollution and was an attack on the values that the ocean beaches stood for, leading to the proposal to ban ocean dumping.

It is worth noting that, in contrast, with the 1930s beach pollution episode and the 1990s waste crisis, the debate over the Waste Disposal Act in 1970 did not bring forth any calls for bans.

12.3.2 Centralisation of Responsibility

The concept of a centralised authority to deal with environmental problems has a long history in New South Wales. The Clean Air Act of 1961, with its establishment of a central operational instrumentality, the Air Pollution Control Branch, and a central advisory body, the Air Pollution Advisory Committee was partly modelled on the Alkali Inspectorate in the United Kingdom (section 4.7.2; appendix B4.4:3). The Clean Waters Act of 1970 followed a similar pattern, with frequent reference in the Legislative Assembly to the need for a centralised authority to overcome the problem of fragmentation of responsibility (section 4.7.4), although there was never any attempt in debates to unpack the concept to examine, for example, the advantages and disadvantages of varying degrees of centralisation. The debate over the State Pollution Control Commission Act 1970, that followed soon after was also structured around the centralisation-fragmentation dualism (section 4.7.6)

The power of this dualism to obscure alternative policy options is nowhere more clear than in the Barton Report into waste management in Sydney in 1970

(section 4.8.1). Despite clear evidence that eight of the 21 rubbish tips Barton visited were being managed satisfactorily by local government, he failed to examine the question of how this was occurring under existing institutional arrangements in some cases, but not in others. Rather, he concluded that the current problems would never have occurred had a central authority with responsibility for waste management been in place, and proceeded to recommend that such an authority be established.

At times when policy problems appear to be complex and inter-dependent, with possible solutions conflicting with other policy goals, the proposal for a central authority removes from politics and the legislature the task of working out a policy response that engages with the complexity and conflicts inherent in the problem. The legislature simply has to set the goals for the proposed authority, which can be done in simple terms without becoming ensnared in the complexity of the problem. This was seen in the debates on the environmental legislation of 1970 when argument could range across the ground of whether the proposed institutional arrangements were sufficient to overcome fragmentation, or whether there were enough 'teeth' in the legislation, or whether the Minister had too much or too little power. Parliamentarians were content to debate the legislation in these terms without ever unpacking any of these simplifications. The attractiveness of the centralised authority to politics surfaced again with the problem of disposing of hazardous waste in the late 1980s, when the high temperature incinerator as a solution appeared much simpler than a number of the alternatives that were being proposed at the time (appendix B6.3.1:27).

With a centralised waste management authority established by the Waste Disposal Act of 1970, the centralisation-fragmentation dualism did not appear in political debate about solid waste management until the late 1980s and the early 1990s. At this time, centralisation of responsibility was seen as more the problem than the solution by a Coalition Government faced with making decisions at a time of heightened environmental concern about siting the large regional landfills that were inevitable with the system of inner transfer stations and peripheral landfills established by the Metropolitan Waste Disposal Authority.

Consequently, the dualism was transformed from centralisation-fragmentation to centralisation-regionalisation with the former becoming the problem and the latter seen as the desirable option. Just as the centralisation concept was never

unpacked in the late 1960s and in 1970, the regionalisation concept was never subject to detailed analysis in the 1990s. Perhaps the clearest evidence of this is in the justification of regionalisation in both the Coalition and Labor policy documents in terms of the economies of scale that would be achieved across groupings of councils (appendix B6.12.3:2, 4; B6.16.3:4). In neither case was there any mention of whether even greater economies of scale might be achieved by centralised waste management authority.

However, while a great deal of debate in the 1990s was structured round the centralisation-regionalisation dualism, this did not prevent fragmentation being put forward as a concern. The Coalition's short-lived 'No Time to Waste' policy document, for example, justified its proposals (including regionalisation!) by reference to fragmented planning (section 6.12). It would appear that this and other brief references to fragmentation in the 1990s debate are a consequence of the rhetorical dimension of policy discourse, i.e. the need for politics to have something to say when faced with problems of public concern. As 'No Time to Waste' demonstrated admirably, it is relatively easy to claim that problems are due to fragmentation or not having the 'right players' using the solutions to which they were best suited, or a failure to use the 'full spectrum' of solutions, and then proceed to claim that the policy proposals will rectify these vaguely defined transgressions of non-controversial and universally accepted policy values such as integration, coordination and comprehensiveness.

The advance towards, and retreat from, centralised waste management responsibility as described above raises some questions with respect to other explanations that have been advanced for what has been termed the demunicipalisation of waste management by Gandy (1993). If demunicipalisation is seen as a loss of waste management functions by local government under the pressure of the increasing complexity of waste management, the increasing capabilities of the large waste management corporations and the application in local government of neo-liberal policies favouring replacement of employees by contractors, then the establishment of the Metropolitan Waste Disposal Authority in 1971 could be seen to some extent as a form of demunicipalisation. Certainly, the liquid waste disposal problem appeared to be beyond the capabilities of some local governments. Local government also lost what little waste planning function it had been performing up to that time.

However, it is important to note that local government's loss was not necessarily the private sector's gain. While the role of the private sector in transport and collection of waste grew during the 1970s and 1980s, substantial areas of waste management were the responsibility of the Metropolitan Waste Disposal Authority, including regulation of waste transport, operation of a large network of transfer stations, operation of putrescible landfills and liquid waste disposal facilities.

From the late 1980s with a Coalition government in power that favoured neo-liberal policies and with further economic concentration in the private sector waste management industry, the stage should have been set for another phase of demunicipalisation. Instead, a period of policy paralysis ensued, that was eventually broken by a change of government and the regionalisation of waste management, wherein waste planning powers were transferred to regional waste boards and local government was encouraged to take a greater role beyond collection of household waste. It is worth noting here that, while neo-liberalism may have favoured the gradual shift of local government waste management functions to the private sector, it was, as argued in section 12.4.2, also partly responsible for this re-municipalisation of waste management which took place in 1995. However, as this chapter shows, there are many other factors that led to this re-municipalisation, not the least the discursive factors discussed in this section and the others in section 12.3.

12.3.3 The Waste Management Hierarchy

As described in section 11.3.1, the waste management hierarchy had its origins with environmental policy in the European Union about 1977. The concept of prioritising waste management approaches appeared in the MWDA in the mid-1980s. By the time of the 1990s waste crisis, the hierarchy and its triangular diagram had become an important policy principle that structured thinking about institutional arrangements for waste management. It was brought forth as evidence of the Coalition Government's action on the waste problem, and was used by various interest groups to position themselves in the policy debate. Throughout the period the hierarchy appeared in waste policy debate, it was a remarkably flexible concept, sometimes being described as a strict hierarchy and other times as a menu of options. In its original form, its top level (or in some cases, second top, level), waste minimisation, referred to the minimisation of the generation of waste (see, for example, figure B2.3.1). However, with the focus on waste disposal to landfill brought about by the Federal and State

Government waste reduction targets, the Coalition and industry interests shifted the meaning of waste minimisation to minimising the amount of waste going to landfill, something that could be achieved by diverting part of the waste stream into recycling. This interpretation of waste minimisation, of course, avoids the need to question the generation of waste by industry. The Labor Party, local government and environmental groups, on the other hand saw waste minimisation as minimising the generation of waste and emphasised this in their versions of the hierarchy (figure 11.3(b), (d); figure 11.4) by placing waste avoidance or consumption reduction at the top of their versions of the hierarchy.

Probably the most striking thing about the waste hierarchy is the contrast between its extensive use in policy debate in the 1990s and its almost total absence of significant content. A few moments of reflection would suggest that the hierarchy is somewhat of an emperor with no clothes. In its strict hierarchical form, it expresses the obvious principle that some approaches to the policy goal of less waste going to landfills will reduce the need for other approaches. For example, the more waste that is not produced, the less there will be to re-use, recycle or dispose of. In its menu of options form, it expresses the commonsense principle that policy options should be chosen to suit the situation to which they are to be applied.

Both of these policy principles are hardly novel or a great step forward in policy analysis. They are probably second nature to policy makers in many areas of public policy. For example, the principles could be embodied in a crime reduction hierarchy going from civic education (=avoidance), security measures (=minimisation), to rehabilitation of criminals (=recycling) to corporal punishment (=disposal!). This example suggests that in most areas of public policy, it would be possible to develop an unremarkable triangular diagram similar to the waste hierarchy.

The question that is of interest is why the hierarchy was used so extensively in the 1990s when, in essence, it is no more than an expression of several unremarkable commonsense policy principles. There are several possible explanations. Firstly, it is clear that in the state of policy paralysis the Coalition found itself in during the early 1990s, due to the constraints that its 'new environmentalism' ideology placed on its options for waste management policy (see section 12.4.2 below), the hierarchy was an attractive 'initiative' to refer to when under attack for its inaction. Secondly, the Coalition's flexible

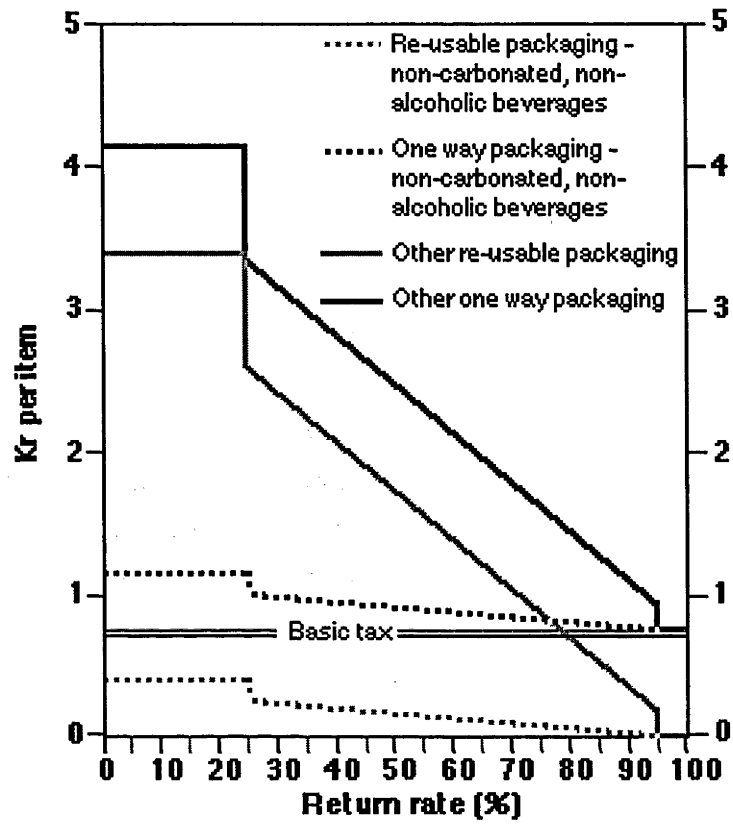
interpretation of waste minimisation could be accommodated in its version of the diagram, thereby enabling it to incorporate the increasing demands from the environmental movement for reduction of waste at source, while avoiding any significant intervention in industry's production of waste. Once the Coalition and industry were deploying the hierarchy in this way in policy debate to protect the interests of industry, the environmental movement would have an incentive to produce a competing hierarchy that expressed its preference for waste reduction at source. By 1995, so many differing interpretations had been attached to the hierarchy, that it is scarcely surprising that the Labor Government felt it necessary to invert the triangle and add arrows and text explanations to produce the version that was an underpinning principle of the Waste Minimisation and Management Act 1995.

12.3.4 Container Deposit Legislation

From a waste management perspective, the principle concern with packaging has been its increasing contribution to the waste stream and its use of composite materials that make separation and recycling more difficult. In theory, a wide range of policy instruments could be considered to meet the policy goal of reducing the amount of waste going to landfill. Internationally, a number of approaches have been used, such as the large scale Duales System Deutschland which requires industry to accept returned packaging or provide for its collection and recycling, the carefully graduated packaging tax in Norway (see figure 12.1), and container deposit legislation that has been introduced into a number of States of the United States.

Even the apparently simple policy instrument of container deposit legislation has many complexities when it is subjected to policy analysis (see, for example, Ackerman, 1997:123-141). Seen against this variety of possible and actual policy responses to the packaging problem, the situation in Sydney from the early 1970s to the 1990s (sections 7.3 and 9.4 and the latter parts of chapter 6) has been remarkably simple and stable. Container deposit legislation started its life as a proposed solution to litter problems and, during the 1990s, became a proposed solution to the increasing amounts of packaging in the waste stream.

Figure 12.1: Beverage packaging tax in Norway, showing the level of tax related to the type of packaging and the return rates being achieved. Source: Figur 4.1: Avgiftssatser 1999 ved ulik returandel og emballasjetype from St meld nr 2, (1998-99), Revidert nasjonalbudsjett 1999, at http://odin.dep.no/html/nofovalt/offpub/repub/98-99/stmld/2/kap04.htm



For some proponents, container deposit legislation represented a turning back of the clock to the 'good old' pre-supermarket days of corner stores and returnable bottles. For the environmental movement it was the legislative embodiment of extended producer responsibility. The Coalition generally opposed container deposit legislation, but nonetheless hinted that its opposition was not necessarily permanent.

The Labor Party favoured container deposit legislation when in opposition, to the extent that it proposed to introduce it if industry did not meet the waste reduction targets set for it. However, when in Government in 1995, Labor did not incorporate container deposit legislation, or the threat of it, into the Waste Minimisation and Management Act — the latter was left to a Democrat amendment in the Legislative Council.

While container deposit legislation has, in comparison with the waste management hierarchy been exposed to more thorough, but contested, policy analysis, such as the Business Regulation Review Unit's report (section 7.3) and the Hopper study (section 10.4), it nonetheless was frequently mentioned in policy debates by its proponents as though its merits were self evident. However, the interesting aspect of container deposit legislation in New South Wales has been what it has achieved as non-legislation by not being introduced. Since at least 1976, the threat of container deposit legislation has been used as a Damoclean sword over the packaging industry as a means of obtaining contributions from industry to fund public education programs, and as a means of encouraging the packaging industry to take the waste reduction plans negotiated with the Government reasonably seriously. It could be argued that container deposit legislation is more valuable to government as a Damoclean sword by which industry can be got to acquiesce to other policy initiatives, rather than if it was enacted and implemented and the defects in the container deposit legislation were exposed. In other words, the combination of performance standards negotiated with government and the threat of harsher regulation if standards are not met may be more effective than the regulation itself.

12.3.5 Waste Reduction Targets

As described in section 6.1.2, a target for the reduction in the per capita quantity of waste going to landfill was introduced by the Federal Government in 1992. This target, and its counterpart in New South Wales was industry wide and did not involve negotiated targets and accompanying covenants and permits at the level of separate firms as has occurred in the Netherlands (Gunningham, Grabosky and Sinclair, 1998:49-50). In contrast, the target for waste reduction appears to have been negotiated with peak industry organisations with very little analysis of the environmental and economic costs and benefits. This target was accepted by both sides of politics in New South Wales, with the Labor Party increasing the target from 50 per cent to 60 per cent as part of its election platform for the 1995 election (section 6.10). The Labor Government also extended the use of targets to industry waste reduction plans and regional waste planning (section 6.15). While the analysis of the means of achieving a particular overall waste reduction target carried out by the Waste Service revealed the potential complexity of targets as policy instruments (appendix B5.2.4), with one exception (see section 12.4.5) targets appeared in political

discourse as unproblematic goals. This contrasts with the obvious distaste for targets among Industry Commission economists (section 11.2.3), although it is worth noting that the economic analysis of waste pricing carried out by the economists of the New South Wales Independent Pricing and Regulatory Tribunal concluded that so many assumptions were needed for the kind of economic estimation of optimal targets favoured by the Industry Commission, that such an approach would be no better than the politicians' arbitrary choice of a 60 per cent target (appendix B2.3).

12.3.6 Packaging Principles

As described in section 11.1, plastic packaging has attracted considerably more media and political attention than its proportion in the waste stream. In addition to container deposit legislation, the environmental movement promoted during the 1990s the idea that re-useable packaging, such a refillable milk bottles, was environmentally superior to disposable packaging, and that paper or cardboard packaging with recycled paper content was environmentally superior to plastic packaging such as polystyrene. In contrast to the general principle of the waste management hierarchy, these principles that related directly to the packaging and dairy industry were hotly contested (section 12.4.4). The environmental movement also introduced the principle of extended producer responsibility into waste policy debate in the early 1990s, although this appears not to have been resisted with such fervour by the packaging industry, possibly because the industry did not wish to expose itself to accusations of irresponsibility.

12.3.7 Recycling

As mentioned in section 9.3.4, during the late 1980s and early 1990s, recycling came to represent the socially acceptable way for householders to contribute to the solution of the global environmental problems that were of concern at the time. For the Coalition, and as described in section 11.2.1, the growth in recycling was tangible evidence of the success of its waste management policy. Fortunately, the economic downturn of the early 1990s and a fall in the quantities of industrial and building and demolition waste going to landfill (figures 1.1, 1.2), helped reinforce this impression. However, as the levels of recycling participation increased during the early 1990s, it also came under

attack both from the Industry Commission, whose economic sensibilities were offended by the political support for recycling in the absence of any rational account of the costs and benefits, and from the more waste-focussed parts of the environmental movement which saw recycling as a distraction from the need to reduce consumption and the generation of waste at source. By mid-1990s, and under the Labor Government and the Waste Minimisation and Management Act, waste minimisation began to overshadow recycling as the main focus of waste management policy.

12.3.8 Waste Management Story-Lines

There is some evidence (section 11.3.3) that the Waste Management Authority attempted to position itself more favourably during the 1990s waste crisis by a graphic (perhaps exaggerated) portrayal of the liquid industrial waste 'crisis' of the late 1960s. However, while it may have been advantageous to the Authority to emphasise its origins in this other 'crisis' (while not mentioning it took some 16 years before a central liquid waste treatment plant was established — section 5.5.1), there is little in the sources available to this study to suggest that this construction of the organisation's history played a significant role in waste policy debate.

12.4 Other Influences on Waste Management Policy

The preceding sections have described a number ways in which it appears that the inherent complexity of waste management policy was rendered tractable in waste policy discourse in 20th century Sydney. In some cases, such as the waste management hierarchy, the concept's main existence was within the political system. In other cases, such as recycling, the concept had multiple existences, both within and outside of the political system. For those in Sydney's fledgling recycling industry grappling with the problems of price volatility, establishment of infrastructure and quality control in the early 1990s, there was a great deal more to recycling than 'closing the loop' that was the preoccupation of the Coalition politicians and a favoured goal of conservation organisations (appendix B9.3.2:5, 6).

What is of interest to this study is the role that these codes or shorthand concepts within the political system played in the formation and evolution of

waste management policy. For example, it is possible that these codes were simply deployed publicly to facilitate justification of policy decisions that had been taken on other grounds. Alternatively, the codes themselves may have placed very real constraints on the availability of policy options. Before these possibilities can be examined in the light of 20th century waste management in Sydney, it is necessary to outline some of the more obvious influences on waste management policy that have been identified in the study.

12.4.1 Geography, Demography and Psephology

In the 19th century, the nature of the terrain surrounding Sydney Harbour played an important role in the distribution of industry, work and social class in Sydney. South and west of Sydney Cove lies the relatively flat Cumberland Plain where the factories of the 19th century could be easily serviced by transport infrastructure that enabled their products to reach markets in the growing settlement and overseas (Spearitt, 1978:192). By 1889, 20 000 of the 25 000 factory jobs in Sydney were in the three municipalities of Sydney, Balmain and Redfern (Spearitt, 1978:116).

Prior to the advent of the private motor car and commuting, people lived within walking distance of their place or work, or of the train and tram lines, so that the inner southern and south-western suburbs became home to the working class, while the eastern and northern suburbs were home to those in the white collar and professional occupations. This demographic differentiation either side of a north west to south east line through the centre of Sydney was also reflected in the distribution of Labor and Liberal electorates, and in the financial status of local governments. Butlin (1976:112) noted that there was still a broad division between the southern councils with relatively low property valuations and less financial resources and the better off northern councils. This broad demographic differentiation was also reflected in the distribution of local landfills, at least up until the early 1970s. For example, Barton's survey of local rubbish tips in 1970 shows the relatively greater number of tips, often receiving industrial waste, south of the Harbour (section 4.8.1). The emergence of coordinated resident protest against the siting of landfills occurred first in the northern suburbs and was successful in preventing the establishment of several landfills in that area (appendix B7.4.2, B7.4.6).

The continuing growth of Sydney in the latter half of the 20th century brought additional geographic, demographic and psephological factors into play. The amount of non-urban space within Sydney's natural bounds of the Blue Mountains in the west, the Royal National Park and various military and catchment reserves to the south, and the Kuring-gai National Park and Hawkesbury estuary to the north was reduced, with the consequent contraction in possible sites for large regional landfills. While the traditional differentiation of voting behaviour either side of the north west to south east axis was maintained to some extent as Sydney grew westwards, the tight 19th century linkages between factory location, place of residence, social class and voting behaviour were no longer to be found in the service economy of the late 20th century. Consequently, as discussions with the well known Australian psephologist, Antony Green, confirmed, the new electorates of Sydney's west, while preserving some of the old differentiation around the north west to south east axis, had a demographic diversity that resulted in a number of swinging electorates in the 1990s, rather than safe seats for one party or the other.

The combination of these long term trends in spatial demography and voting behaviour, and the need to site landfills on Sydney's western periphery, was important in the politicisation and policy paralysis of waste management in the 1990s. The natural bounds of the Blue Mountains, Royal National Park and Kuring -gai National Park also meant that, as Sydney grew, waste management policy could not proceed in incremental fashion by gradually shifting peripheral landfills further afield. If landfills within the natural bounds were not feasible, then the next best sites were very much further away, such as in the Hunter Valley to the north or the southern tablelands to the south (appendix B7.4.13; B7.4.15).

A further long term trend that contributed to the politicisation of waste management in the 1990s was the withdrawal of, and structural change in, manufacturing industry from immediately south of the Harbour. This resulted in industrial sites becoming available for residential or recreational development, and the 'discovery' of the industrial wastes of previous eras, something which made good news copy and contributed to the growing public concerns about toxic wastes in the late 1980s.

To these trends can be added the changes in meaning attributed to waste and waste places over time discussed in section 12.2, above. As the waste lands of the 19th century took on new symbolic meanings as the nation's gymnasium

(the ocean beaches), important ecosystems (harbour estuaries and wetlands), and the birthplace of the nation and site of public penances for global environmental problems (the Harbour), there was an inevitable contraction in the areas where waste might be deposited legally, or tolerated as illegal deposits.

Finally, the appearance of plastics and inadvertent contamination by hazardous chemicals in the waste stream resulted in new fears about landfills that contributed to public resistance to having them in their vicinity, thereby making it increasingly difficult to site landfills in the few remaining suitable areas.

12.4.2 The Constraints of Political Ideology

Section 12.4.1, above, describes the broad long term trends within which governments of any political persuasion would have to work in developing waste management policy. From the post-war period to the end of the 1980s, the political ideology of the party in government appears to have had little impact on the formation of waste management policy. There was a tendency, at least in Parliamentary debate, for Labor to favour a greater degree of compulsion on industry to ensure it disposed of its wastes without causing significant environmental problems, and the Coalition to favour cooperative approaches with industry. Prevention of discharges into rivers by industry had the potential to disadvantage industry, and the Coalition's Clean Waters Act of 1970 had an advisory committee and ministerial discretion to protect the interests of industry. Provision of facilities for land disposal of liquid waste was, on the other hand, of benefit to industry, and the Waste Disposal Act of 1970 established a statutory authority with greater independence from ministerial intervention.

The opposite tended to be the case when it came to littering by individuals. with the Coalition favouring harsher penalties and Labor promoting the virtues of public education. Despite these differences, the Metropolitan Waste Disposal Authority appears to have functioned equally satisfactorily for some 18 years under both Coalition and Labor Governments. Both Coalition and Labor Governments probably contributed equally to the inordinately long time it took to establish a central treatment plant for liquid industrial waste, and to close the Castlereagh Depot.

However, the 1990s waste crisis demonstrated very clearly how political ideology closed off some waste management policy options for the Coalition, but made these options possible for the Labor Government. Central to the policy paralysis of the early 1990s was Premier Greiner's 'new environmentalism' which attempted to reconcile the need for governments to exercise some control over industry and commerce to protect the environment and the Coalition's ideological preferences for small government and markets unencumbered by government intervention. It is possible to point to particular policy preferences of the Coalition, such as removing the Waste Management Authority's monopoly on putrescible waste disposal, as being ideologically driven. Undoubtedly, local government and the public were deeply suspicious of the environmental consequences of putrescible waste landfills operated by the private sector, which saw these landfills as a lucrative new business. In addition, neither the Coalition nor the waste industry itself was ever able to provide a convincing explanation as to how reductions in waste would be achieved when profits could be maximised by filling landfills as quickly as possible. A Coalition proposal introduced in the Green Paper — the economistic logic that communities should be compensated for landfills in their vicinity — raised the ire of those who saw the problem in the moral framing of landfill siting as a question of whose waste should end up in whose backyard.

While the Coalition's political ideologies resulted in a number of policy proposals that did not attract wide support, comparison of the Coalition's 'No Time to Waste' policy document with Labor's 'Waste Reforms' would suggest a simpler and more basic reason for the Coalition being a prisoner of its own ideology. In terms of policy substance, there was not a great deal of difference in the two documents — both proposed the regionalisation of waste management and a strengthening of industry waste reduction plans. In terms of policy detail, however, there was a great deal of difference. The Labor document surrounded the policy substance with a detailed set of regulatory and administrative proposals that were seen as excessive bureaucracy by the Coalition. The Coalition document surrounded its policy substance with appeals to 'motherhood' values, such as coordination, integration, local participation, and to its own ideological values, such as minimising intervention in industry. For the Coalition, landfill space was a commodity suffering over-consumption. For Labor, landfill was public infrastructure. This difference was not simply an error of 'spin doctoring' by the writers of the Coalition document. Rather it is a fundamental consequence of the Coalition's political ideology. If a government aspires to small government and to leaving

many coordinating functions to the powers of the free market, then it is difficult to put together a comprehensive and cohesive package of reforms that does not have the appearance of excessive government intervention. While neo-liberal policy making has a range of economic policy instruments available to it, these do not lend themselves to packaging together in a substantial piece of legislation. Rather, such policy instruments are more suited to application to specific instances of market failure.

While the Labor Party's platform for the 1995 election was structured around the more populist waste management policy options, such as introducing container deposit legislation or banning incineration, once in government it did not have the constraints of free market ideology in preparing its response to the waste problems of the time. Consequently, it was able to propose what appeared to be a comprehensive package of reforms, with considerable detail of the bureaucratic machinery by which the reforms would operate. Had the Coalition introduced legislation similar to the 1995 Waste Minimisation and Management Act in the early 1990s, much of the politicisation and policy paralysis of the waste crisis might have been avoided. However, such a course of action was not open to the Coalition, rather it had little choice but to canvass various free market options and attempt to disengage itself from politically damaging landfill siting decisions. Regionalisation as proposed by the Coalition had the appearance of an abrogation of responsibility. The same regionalisation proposed by Labor, and surrounded with a detailed description of the bureaucratic arrangements, had the appearance of substantial policy reform. Given the heightened environmental concern of the early 1990s, the connections between waste issues and global environmental concerns, and the media attention to waste mountains and Harbours full of waste, substantial policy reform was what the public was looking for from government, not apparent abrogation of responsibility.

There are of course, other contributing factors to the inability of the Coalition to respond to the 1990s waste crisis in a way that attracted broad support. Because of the involvement of local government in waste management, through household waste collection, kerbside collection of recyclables and, in some cases, operation of landfills, any State Government waste management initiatives have to interface with the needs of local government. Given the Labor Party's more extensive involvement in local government politics, the Labor Party was in a better position to gain the cooperation of local government. Certainly, the sources available to this study provide more

evidence of consultation between Labor and local government and of a more favourable response by local government to Labor's waste management proposals.

12.4.3 The Metropolitan Waste Disposal Authority

Given that this large statutory authority and its successors have played a major and central role in waste management in Sydney for nearly 30 years, it could be expected that the Authority might have had an important influence on waste management policy. The Authority was a convenient scapegoat for Coalition politicians in the 1990s waste crisis. They were able represent it as an organisation focussed on filling holes in the ground with waste. However, the Authority paid considerable attention to alternatives to landfill right from the time of its establishment, insofar as its professional staff were aware of developments in recycling, composting, and resource recovery occurring overseas. The Authority also espoused a policy of industry waste reduction in the late 1970s, long before this issue gained wider political attention. Despite this, the actual implementation of waste management alternatives to landfill was very slow and, by the 1990s waste crisis, certainly slower than what the Government would have preferred. To a certain extent, this failure of the Authority to be responsive to public concern about the increasing waste stream and landfills, was as much the fault of its political masters. With the Authority's ongoing research into alternatives, and its watching brief on overseas developments, it was always simple for a Minister to deflect criticism by referring to this work.

With the advantage of hindsight, it seems to have taken the political system an inordinately long period of time to realise that a statutory authority set up to take responsibility for disposal of the waste stream, with all the engineering expertise and centralised waste management infrastructure that this responsibility entails, would have difficulty influencing the quality and quantity of the waste stream. Centralised resource recovery plants appealed more to engineering expertise than the complex task of organising the collection of recyclables and finding markets for their use. The design of centralised composting was more appealing than the task of marketing the output. It took almost ten years from when kerbside recycling was first proposed until it was successfully implemented through the Council Recycling Rebate Scheme.

In addition to the problems of turning parts of an engineering organisation into a marketing organisation, there were other more basic reasons that contributed to the momentum of the Authority. The Authority made great advances in the prevention of environmental impacts from landfills. These techniques added to the cost of establishing and managing landfills, although these costs were more of the nature of fixed costs related to the landfill rather than variable costs related to the volume of waste received. Thus, the more waste could be received in a landfill, the greater the amount of money could be devoted to environmental management. With this logic, more waste could be good for the environment, and the Authority generally seemed comfortable with waste planning projections that showed ever increasing volumes of waste. But the 1990s brought a change in the relationship between landfill and environment when waste issues became symbolic of global environmental problems and shortcomings of modern industrial societies. Landfill capacity became a scarce resource symbolic of other scarce resources, and graphs of waste volumes sloping upwards to the right became matters of environmental concern.

However, even if the Authority had been sensitive to the changing symbolic meanings of the millions of tonnes of waste it managed each year, it is unlikely it could have done much more that it did. If the totality of the materials flow from mining, through manufacturing, consumption to disposal is considered, policy intervention becomes more difficult the further upstream the locus of application of policy is shifted, as Wynne (1992) pointed out (section 2.6.2). Policy initiatives further upstream involve a greater degree of intervention in the affairs of industry, which is often resisted by industry (except in the special circumstances identified in section 12.6.4, below), and has uncertain outcomes. Such a shift would also require a change in the nature of the professional expertise of the Authority — something which would not occur readily.

The effect of centralised authority on waste management has received some attention in other studies, such as those by Gandy (1993, 1994), in which it was concluded that higher levels of recycling were attained where waste management was the responsibility of a central authority. Gandy (1993) compares Hamburg, which had a central authority responsible for both strategic planning and the operations of collection and disposal, and a recycling rate of 13 per cent (tonnage recycled as a percentage of total waste generated), with London, which had responsibility distributed between local governments and the Greater London Council, and a recycling rate of 2 per cent. However, in the same period (1989-90), Sydney, with a similar distribution of

responsibility across levels of government as in London, had a recycling rate estimated by the MWDA to be of the order of 17 per cent (appendix B5.7.3:11).

While the difficulties in estimating recycling rates, such as accounting for on-site recycling by manufacturing firms, mean that the possibility cannot be ruled out that these differences are measurement artefacts, several factors can be identified that may have contributed to the Sydney recycling rate being higher than that in London, or to the Sydney rate not being higher than that actually achieved in 1989-90. In the case of the former, there is little doubt that the efforts of the beverage, packaging and paper industries to avoid government intervention through such policy instruments as container deposit legislation, coupled with the favourable economics of recycling aluminium, and to a lesser extent, glass and paper, contributed to the increase in recycling during the 1980s. By 1989, the recycling rate for cans, for example, had reached 56 per cent (B9.3:18). On the other hand, because of the initial difficulties experienced by the Metropolitan Waste Disposal Authority in negotiating with local government to trial kerbside collection, the expansion of the latter was delayed for some years while the Authority experimented with a 'bring' system (the Glenquarrie Buy Back and Recycling Centre). This temporary abandonment of kerbside collection occurred despite recommendations by an advisory committee that were equally favourable towards kerbside collection and the 'bring' system. By the time the then Waste Management Authority introduced the Recycling Rebate Scheme, a number of local governments had already introduced kerbside recycling themselves (sections 5.6.5-7).

12.4.4 Industry

There is little doubt from the sources available to this study that industry in Sydney has been a substantial influence on waste management policy, at least since the late 1960s. As described in section 4.7.5, the 1970 Waste Disposal Act had its origins in the growth of manufacturing industry in the post-war period, the concomitant growth in volumes of liquid industrial waste for disposal, and the growing public concern about water pollution that displaced much of this liquid waste out of streams into local government rubbish tips. Industry had already experienced difficulties with 'over-zealous' councils who placed the comfort of their residents ahead of either industry profitability or State Government economic development goals. For this reason, the formation of a central authority to take control of waste disposal, liquid waste included, was

favoured by industry as a means of reducing uncertainty about the standards to which it would have to comply, and decreasing its exposure to the vagaries of local government attention to pollution.

With the formation of the MWDA, and the establishment of the Castlereagh Depot, industry was content to pay a reasonable charge to transfer the environmental risks of liquid industrial waste from itself to the State Government. For those firms which did not want to pay the charge, there was a thriving illegal disposal industry based on road tanker owner/operators who would, for a lesser fee, find a sewer manhole or an area of deserted bushland in which to discharge the wastes. It was the State Government's inability to control illegal dumping of industrial liquid waste, the inherent newsworthiness of toxic waste dumping stories, and the growing accumulation at Castlereagh that made a significant contribution to the public resistance to landfills in western Sydney in the 1990s.

The other strategy pursued by industry (necessitated in part by the Government policies pertaining to the disposal of hazardous chemicals) was to simply stockpile liquid industrial waste. By building up a stockpile of some 8000 tonnes of hexachlorobenzene, ICI Australia successfully transformed what was originally a private disposal problem into a public disposal problem. This stockpile, located not far from central Sydney, became the focus of public concern and a great deal of political attention at both the State and Federal level, comprising as it did a substantial part of Australia's total inventory of intractable waste. The attempts by the State Government to site a high temperature incinerator in New South Wales, the massive community resistance that emerged, and the media stories that kept toxic waste before the public were a second significant contribution to the difficulties the Coalition Government experienced in siting regional landfills in western Sydney in the 1990s.

The other area in which industry has had a significant influence on policy is packaging waste. While some elements of the environmental movement might represent the increase of packaging waste as some form of corporate conspiracy and environmental immorality, the real reasons behind the increase more probably lie with the synergistic relationship between modern retailing and packaging. The emergence of supermarkets as the dominant form of grocery retailing provided a lucrative opportunity for an expansion in the volume and complexity of packaging. Today the packaging industry could not survive

without the modern forms of retailing — and the retail industry could not survive without packaging.

The special qualities of plastic, both as a packaging material and as a source of public concern, together with the apparent simplicity of container deposit legislation has meant that the packaging and beverage industries have had to devote considerable resources to protecting themselves from the types of government intervention that have occurred overseas. From the early 1970s, the industry pursued the strategy that had already proved successful in the United States of representing litter as a problem of civic misdemeanour, rather than an oversupply of materials more likely to end up as litter. The Litter and Recycling Research Association, and its successor, the Beverage Industry Environment Council have also allocated substantial resources to behavioural psychology and descriptive behavioural research that focuses on individual action in the household or in public places. Reeve, Ramasubramanian and McNeill (2000) in a review of New South Wales and overseas litter research made a strong case that such research has long passed the point of diminishing marginal returns to research, which leads to the conclusion that the research, which gains considerable media exposure, is more important to the industry as a means of deflecting attention from its role in the creation of the packaging, some or all of which becomes a litter or a waste disposal problem.

The second research strategy pursued by industry is analysis of the environmental impacts and benefits and costs of various forms of packaging. This can generally be reckoned upon to cast doubt upon the simple principles, often promoted by environmental groups, that suggest which forms of packaging might be more desirable. Because these principles, such as refillable milk bottles being preferable to plastic ones, or paper packaging being preferable to polystyrene, can have political appeal, they pose a danger to the industry as a source of possible policy intervention. Given the noncomparability of the various environmental impacts that are of concern, such as greenhouse gas emissions, emissions of hazardous chemicals in manufacture or disposal, or use of forest resources, such analyses inevitably fail to provide incontrovertible evidence in favour of one form of packaging over another, except in the obvious cases of grossly damaging packaging which is unlikely to be on the market in any case. The value of this form of research to industry was well shown in the reaction of industry to the introduction of the Waste Minimisation and Management Bill in 1995. While publicly welcoming the Act and signalling support for its the goals, industry vigorously lobbied the

Coalition and the Call to Australia Party with meetings and faxes to introduce an amendment to the Bill that would require analyses of the environmental and economic costs and benefits to be carried out on any industry waste reduction plans.

Since the early 1970s, it would appear that the main impact on waste management policy of the defensive industry strategies described above has been to stifle policy innovation in, as was noted in the previous section, the difficult issue of shifting the locus of policy application away from the downstream end of the materials flow. For the last 30 years, policy evolution in the area of packaging waste has been characterised by incremental concessions gained from industry through governments' use of the Damoclean sword of container deposit legislation. As a result, resources have been directed to public education to deal with the civic misdemeanour dimension of the problem and, ironically, container deposit legislation which may be less than ideal as a policy instrument has distracted attention from other instruments, such as the Duales System Deutschland and the beverage packaging tax system in Norway which may be more desirable instruments.

This is not to say, of course, that industry has steadfastly refused to respond to environmental concerns. The role of industry in increasing the recycling rate in the 1980s was referred to in the previous section. However, it could probably be said that industry has successfully retarded the rate of response to a level that protects its investment in existing plant, i.e. environmental responses are accommodated in the normal cycles of replacement of plant, rather than being obtained at the expense of premature replacement. This level, of course, falls well short of the demands of the environmental movement and may, in some circumstances lead to the exacerbation of environmental problems thus bringing more odium to industry. An example of this on a long time scale is the packaging and chemical industries' tardiness in responding to public concerns about plastic. Because plastic remained (and increased in quantity) in the waste stream in the 1960s and 1970s, municipal incineration technology that had functioned well over the preceding 70 years failed due to corrosion problems caused by burning plastics. The plastics also contributed to dioxin emissions, the latter having the toxicity, latency, and invisibility to mobilise strong public resistance to incineration. Consequently, the MWDA became increasingly dependent on landfill, leading to the waste crisis of the late 1980s and early 1990s. This crisis brought the packaging and chemical industries back to the

centre stage of waste politics, where they were exposed to further demands for intervention.

12.4.5 The Disabling of Political Momentum by Science

The capacity of analyses of environmental and economic impacts, or even simply improved knowledge of the waste stream, to cast doubt on principles or codes that reduce the complexity inherent in waste management choices has been demonstrated in areas other than the defensive strategies employed by industry that were mentioned in the previous section. For example, as the knowledge of the volume and nature of the waste stream improved during the 1990s, this also cast doubt on the accuracy of the 1990 base-line on which the waste reduction targets were based (section 11.2.3).

As described in section 12.3.7, the gloss on recycling as the main thrust in reducing waste to landfill was tarnished by both economic arguments and the environmental movement's exposure of the relationship between recycling rates and waste generation rates. The politicians' need for such codes was shown by Environment Minister Pam Allan's rejection of Industry Commission findings as 'out of step' with 'community demands' (appendix B6.15.3:10).

The fragility of the political legitimacy of these principles and codes was demonstrated by the Coalition Opposition's criticism of both waste reduction targets and of the waste management hierarchy (policy principles that it had supported throughout its period in government) in the debate on the Waste Minimisation and Management Bill in 1995. The desirability of industry waste reduction targets was easily brought into doubt by posing questions as to whether targets should apply equally across all firms in an industry sector as moral logic would suggest, or whether those firms which could make reductions more cheaply should have more stringent targets, as economic logic would suggest. The strict hierarchy version of the waste management hierarchy was readily brought into doubt by deploying the arguments of the menu of options version that point to instances where a waste management approach higher on the hierarchy would be more costly, both economically and environmentally, than an approach lower on the hierarchy. The ease of discrediting the basic codes on which policy consensus was founded points to an important aspect of the 'constructive dialogue' held by Papadakis (1996) as being important in institutional innovation. It may be the case that the survival

of such dialogue depends on the parties involved refraining from wielding scientific rationality that places value on logic, experimental method and explanation by causation (as is found in such evaluative techniques as environmental impact assessment, cost benefit analysis, or life cycle analysis) in the interest of maintaining a set of codes and principles around which policy consensus can be built.

It would seem, then, for those in the political system, scientific rationality is a two-edged sword. On the one hand, it promises policy solutions based on objective measurement and impeccable logic — on the other, these promises may be in many cases empty promises when scientific rationality destroys the codes and principles with which the political system must work. Life cycle analysis, with its promise of an objective assessment of the environmental advantages and disadvantages of products, is an example of a scientific technique that is appealing to politicians (section 11.3.4). Yet, as a number of studies have shown, it often reduces to choices between non-comparable environmental impacts which have to be made subjectively. For example, Dutch life cycle analysis practitioners acknowledge the non-comparability problem and attempt to use social survey techniques to obtain weighting factors that are held to reflect the preferences of the populace as a whole for the different impacts (see:

http://www.pre.nl/life_cycle_assessment/impact_assessment.htm

and linked pages at this site). Pöll and Schneider (1993:7-9), in making a case for translating all environmental impacts into the economist's favoured metric of market prices, describe two life cycle analyses (termed 'eco-balances') for returnable and non-returnable milk containers that, in addition to arriving at non-comparable lists of impacts, came to opposite conclusions across all the impacts as to which type of container was more environmentally friendly.

Of course, this is not to say that life cycle analysis is incapable of supporting *any* assessments as to the environmental friendliness of manufactured products. Obviously, a little of this analysis would soon demonstrate that paper packaging was preferable to packaging laced with radioactivity and dioxin. However, it is incapable of providing firm answers to the sorts of questions that matter to politicians and the public, such as whether plastic packaging might be preferred, or not preferred, to paper packaging.

Once it is generally realised that the apparent environmental merit of products can be changed simply by altering the subjective weightings applied to their

health, ecological and resource impacts, or by including or excluding second and third round impacts, any political momentum that may be built around the 'objectivity' of life cycle analysis will always be prone to dissipation by exposure of its non-comparabilities and subjectivities. For these reasons, it is the socially constructed meanings attached to materials entering the waste stream, such as plastics and paper, that become important in explaining where political attention and policy effort is directed. The ambiguous and dangerous qualities of plastic discussed in section 12.2.1, above, are likely to ensure its prominence in waste debates in the future, regardless of efforts by industry to wield scientific rationality in its defence.

12.4.6 Environmental Movements

There is little doubt that environmental movements, in particular the Sydney Friends of Earth and the Waste Crisis Network had some influence on the evolution of waste management policy. Probably most important influence of these groups was their capacity throughout the early 1990s to continually publicise and argue for waste reduction and minimisation as legitimate and preferable policy alternatives to recycling. As described in section 11.2.1, it was the Waste Crisis Network and the Nature Conservation Council that undermined the political legitimacy of recycling by using the Government's own waste disposal and recycling figures to show that the suburbs with the best recycling performance were also sending the most waste to landfill. The waste management policies of Labor when elected in 1995 clearly reflected some of the ideas, such as extended producer responsibility, that had been promoted by the Friends of the Earth and the Waste Crisis Network.

12.4.7 Small but Important Influences

There are two influences on the evolution of waste management policy that could be said to be far more important than they appear at first sight. The first is particular persons whose actions would seem, at least with the advantage of hindsight, to have transformed policy debates. For just under 20 years, the Castlereagh Depot was a minor policy issue which each side of politics could use to blame the other for its continued existence, and which both sides, when in government, could make reassuring statements about as to its necessity and safety, while over-riding Penrith Council's objections as the Depot needed to be

extended from time to time to accommodate the growing amount of industrial waste. This state of affairs probably would have continued through the 1990s, if not for the election of the Labor candidate, Paul Gibson, as member for the Londonderry electorate in which the Castlereagh Depot lay. Gibson's style was to put the concerns of his electorate ahead of both his party's interests and the calls for bipartisan support for high temperature incineration, ensuring that the Castlereagh Depot issue was continually brought to the attention of politics and the media. It was Gibson's persistence that brought to an end the benign neglect practiced for 20 years by both sides of politics. However, it should be noted that both the mega-tip siting proposals and the increased levels of public environmental concern in the early 1990s probably made his task easier than it would have otherwise been in the absence of these factors.

The second small but significant influence on waste management policy is the 'lumpiness' of investment in landfill capacity, i.e. although there is a constant stream of waste for disposal, landfills have to be established sequentially to accommodate this. So while the waste stream appears as a given and constant fact of life, the establishment of a landfill, as is also the case with mining and other site specific development proposals, appears as a one-off event for those affected by it. A proposed landfill (or incinerator) has a location in space and a point in time which can more readily focus community and political attention than something like the waste stream, which is derived from all parts of urban space and is occurring all the time. Doyle and Kellow (1995:270) suggested that it might be expected that environmental groups would play a greater role where issues are 'lumpy', arguing that the normal politics of compromise become difficult with such issues, thus leading environmental groups to try to work outside of mainstream politics. In Sydney's case, the combination of centralisation of waste management and the inherent lumpiness of investment in landfill certainly led to mega-tip proposals that captured community and media attention to a greater extent than would have a series of smaller landfills. However, it could hardly be said that environmental groups such as the Waste Crisis Network and the Total Environment Centre operated outside of mainstream politics during the early 1990s, given the calibre of their policy analysis, the consensual approach of the latter group, and their access to ministers and the legislature. It may be the case that Doyle and Kellow's view is more applicable to mining proposals, where the private sector may be less inclined to consensual relations with its critics and the nature of the public interest is not so readily articulated.

12.5 The Influence of Discursive and Structural Factors

At first sight, the influences on waste management policy described in the previous section would appear to be more important than any influence that the simplifications, principles and codes described in section 12.3 may have had. However, there was at least one instance when the way in which the policy problem was framed was critical in obtaining a consensus among various interest groups as to what policy response was required.

In the case of the 1970 Waste Disposal Act, the interests that various groups had in the establishment of a central authority to take control of the disposal of industrial and municipal waste were clearly articulated in the Barton Report of 1970. Both industries generating liquid waste and those transporting and disposing of it favoured a central authority as a means of reducing the risks they faced. Local government favoured a central authority because it would relieve it of the difficulties of disposing of liquid industrial waste at local government tips, a service that some councils believed they should not be responsible for providing to industry. For the State Government, the provision of a service to industry through the Metropolitan Waste Disposal Authority, enabled it to continue to demonstrate its program of support for industry that commenced with the Department of Decentralisation and Development.

While there were good reasons for all the groups involved in the liquid waste 'crisis' of late 1969 to support a central authority for waste disposal, this is not to say that existing institutional arrangements for dealing with industrial and municipal waste were in complete disarray or totally ineffective. As Barton discovered, there were a substantial number of municipal and private tips in Sydney that were disposing of municipal and industrial waste in a satisfactory way. But an approach that built on existing institutional arrangements was likely to be less attractive to the various groups. For example, it might have been theoretically possible to increase the resources of the Department of Health to improve the monitoring of industrial and municipal tips, to amend the Local Government Act to clarify the responsibilities of councils with respect to liquid waste generated within their boundaries and to give councils greater powers to require pre-treatment (de-watering in particular) of liquid wastes by industry before accepting it for disposal in council tips. However, either the officers of the Health Department or its Minister, or both, were not happy with their increasing burden of environmental responsibilities under the Clean

Waters Act. An approach that increased their involvement still further would have faced strong opposition from the Minister for Health. Similarly, an approach that required councils to have greater involvement in liquid waste disposal would have been opposed by the Local Government Association.

Overall, the framing of the waste problems of the late 1960s as a question of fragmentation of responsibility that required a central authority as a solution enabled a coincidence of interest among the various groups involved that would not have been possible had the problem been framed as a need for strengthening or clarifying of existing institutional arrangements. The approach of the waste transport and disposal industry to the Department of Decentralisation and Development may have been a fortuitous event in that it placed the task of the initial framing of the problem with a department and a committee (the State Development Co-ordinating Committee) oriented to thinking in terms of the coordination of support for industry. The terms of reference given to Barton, and particularly the second one of the two: 'measures which should be taken to prepare for and organise a comprehensive and co-ordinated approach to the overall problem of waste disposal and pollution control in the future', may have reflected this orientation and resulted in the study findings that were so readily acceptable to the various groups involved. However, the framing of environmental problems as being due to lack of coordination and to fragmentation of responsibility cannot be solely seen as the result of the involvement of the Department of Decentralisation and Development and the State Development Co-ordinating Committee. This framing had been extensively used by both sides of politics in New South Wales in all of the environmental legislation that preceded the Waste Disposal Act. It is possible, though, that the increasing environmental concern in the late 1960s and early 1970s supported the fragmentation framing. During this period, new and previously unimagined environmental problems were emerging in areas that either spanned the division of responsibilities among government departments, or that imposed environmental considerations on departments whose responsibilities had never included them before. Consequently, even if the Department of Decentralisation and Development and the State Development Co-ordinating Committee had not been involved, it seems highly unlikely that the liquid industrial waste 'crisis' would have been framed in any other way than as a problem of fragmentation of responsibility.

The genesis of the 1970 Waste Disposal Act provides strong support for the views of those, such as Hajer, who wish to emphasise the discursive aspects of

problem definition as explanations for policy formation. However, the genesis of the 1995 Waste Minimisation and Management Act demonstrates that, regardless of the appeal of the connections that can be discerned between policy discourse and policy formation, there are also important physical and structural factors at work. Regardless of the nature of waste policy discourse in the 1980s and early 1990s, the physical, demographic and psephological factors described in section 12.4.1, above, made it virtually inevitable that landfill siting would become a difficult political issue.

To generalise from Sydney's experience in the 1980s and early 1990s, it would appear that there are at least four conditions that can lead to waste policy paralysis as cities expand in size. If the government holds power by a small majority in the legislature, if the system of government involves representatives in the legislature being elected from relatively small geographic areas, if there is a tendency for marginal electorates to occur on the outskirts of the city, and if landfill siting options are also confined to the city outskirts, then it is likely that the government will be unable to site landfills in a timely fashion to keep pace with waste generation. In Sydney's case, the absence of any one of these conditions would probably have prevented the waste crisis of the early 1990s reaching the proportions that it did.

Had the Coalition Government held a more substantial majority, the opposition to landfills would not have been a threat to its remaining in power. If the electorates of the members of the Legislative Assembly had been sufficiently large that the concerns of residents in the vicinity of proposed landfills could be ignored in the interests of the waste disposal needs of a much larger population, landfills could have been sited without endangering the seats of sitting members. Also, the seats of sitting members would not have been threatened by opposition to landfills if the seats had been held by a safe margin. And if the Waste Management Authority had been able to consider a greater range of sites in less densely settled areas a little further away from Sydney, but not so far as to constitute a great leap in both costs and thinking about waste transport, the marginal electorates of western Sydney would not have become involved.

To conclude this section's assessment of the relative importance of discursive and structural influences (using the latter term in the widest possible sense to include the influences discussed in sections 12.4.1-3 and parts of 12.4.4) on waste management policy, it would appear that neither has a monopoly on

explanation. It might plausibly be argued that the two are complementary and interacting rather than independent and competing. Perhaps the most important way in which structural and discursive influences interact relates to the difficulty of discursive closure. Structural influences can determine the difficulties and complexities of the domain within which policy discourse has to operate. If physical, historical and structural circumstances allow a ready solution to an environmental problem, then policy discourse can relatively easily arrive at a framing of the problem that matches this solution. For example, had a central waste management authority already existed in Sydney in the 1960s, then the centralisation-fragmentation dualism would not have been available to bring the convergence of interest that enabled institutional change. Had there been more knowledge of waste quantities and the availability of disposal sites, there may have not been the same preparedness among politicians simply to leave the task of disposal to the proposed central authority. It follows from this, then, that the idea of generative metaphors as a means of bringing discursive closure (as put forward by Schön and Rein, 1994 and Hajer, 1995) may be more applicable to situations where structural factors permit a feasible solution.

In situations where such a solution is not so readily forthcoming, the political system may give rise to any number of discursive devices such as dualisms, codes, metaphors or simplified policy principles as attempts at discursive closure proceed. Structural factors also constrain the availability of such devices. For example, in the 1990s waste crisis, a central authority already existed, so the centralisation-fragmentation dualism was not available to policy discourse. These discursive devices may be woven into the sorts of story-lines that Hajer found associated with acid rain policy in Britain and the Netherlands or, as appears to be more the case with the 1990s waste crisis in Sydney, these discursive devices may fall in and out of favour as the appeal of a simple principle to cut through the policy complexity evaporates when one or other group of policy actors decide to discredit the principle by the application of scientific rationality in the ways described in section 12.4.5. The failure of policy discourse to bring discursive closure may also be a consequence of incompatibilities in the way various policy actors frame the problem, as Williams and Matheny (1995) found with long running hazardous waste issues in the USA. Certainly, the Castlereagh Depot issue showed the tensions generated by the incompatibilities between managerial and communitarian framings. When discursive closure fails to occur for either of the above reasons, and policy paralysis sets in, it may be structural influences that finally break the

impasse. In the case of Sydney, the election to government of a political party that was not averse to basing its waste management policy on wide ranging administrative reforms was what brought the 1990s waste crisis to an end with the introduction of the 1995 Waste Minimisation and Management Bill.

It should be noted that, from a longer historical perspective, the policy outcomes and institutional change that result from discursive practice in one decade can become structural influences in the next decade. For example, the fragmentation framing of the late 1960s that made a central authority in the form of the Metropolitan Waste Disposal Authority a self-evident solution put in place a large waste management bureaucracy that was a structural influence in the 1990s waste crisis.

Finally, it should be emphasised that the above account of the complementarity of, and relationship between, structural and discursive factors does not claim to be a theory that might challenge other theories of waste management and environmental policy making. Rather it has the much more modest goal of drawing attention to the insights that might await those who pursue the methodologically pragmatic approach mentioned in section 3.1.

12.6 Trends in Waste Policy Making

From the broad historical perspective of this study, a number of trends in waste policy making in Sydney can be identified. The following subsections discuss these trends, commencing with simple observations about waste management generally, followed by speculation about cyclicity in the distribution of responsibility for waste management, and finally moving to an evaluation of the extent to which various theories of long term change in environmental policy making are supported by Sydney's experience in waste management policy.

12.6.1 Growing Physical, Institutional and Perceptual Diversity

Starting with the physical and engineering aspects, there is little doubt that waste management has become more professionalised, the waste stream more diverse in its composition and prone to fairly rapid changes in composition. Waste management institutions have become more complex as State and Federal governments have taken on new roles in waste management (the

'institutionalisation' of waste management in the terminology of Morrison, 1986 or Langton, 1984). As Gandy (1993) argues, this complexity has contributed to the difficulties local governments face in carrying out their waste management responsibilities, and to the penetration of waste management operations by large corporations.

However, the symbolism of waste and waste management has also become more diverse, insofar as household waste practices are increasingly understood in terms of not just simple home hygiene, but also in terms of regional and global environmental problems. The householder who, in the 1950s, was simply 'putting out the rubbish' may be, in the 1990s, recycling to 'do their bit for the environment', avoiding buying plastic packaging to reduce fossil fuel usage (or to prevent plastics ending up in landfills and 'lasting forever'), or composting their kitchen scraps to 'help Sydney meet the Waste Challenge'. These additional layers of meaning that have been taken on by household rubbish prepare the stage for such rubbish, or litter, to become the objectification of global environmental concerns (section 7.2.2). The public's desire to take action to address these concerns is deflected into household recycling and community clean ups by the impossibility of individual action to remedy such things as the greenhouse effect or ozone holes , as the rapid uptake of recycling and participation in clean-up campaigns showed in the early 1990s. The implication for waste management policy is that community mobilisation and political attention to waste may be catalysed not only by waste management events, but also by other environmental events that are physically disparate but symbolically connected. To express this in terms of Kingdon's model of environmental policy making (appendix B2.7.3), the policy entrepreneur has to scan not only the waste problem stream, but also the stream of broader environmental problems, as either could project waste management into public concern and debate.

12.6.2 Cycles of Distributed and Centralised Waste Management

The institutional arrangements for waste management in Sydney (and London — see Gandy, 1993) appear to have gone through greater changes over time than other large cities for which accounts are available. In 1970, Sydney went from a decentralised system where almost all waste management functions rested with a large number of local governments, to a partly centralised system, in which local government was responsible for collecting waste, while a State instrumentality was responsible for transporting and disposing of much of this waste, and for the associated large scale waste planning. Then in 1995, the planning and landfill siting functions were transferred back to groups of local governments, leaving the State instrumentality to operate existing waste management infrastructure, partly in competition with private operators.

These changes, and the politics that accompanied them, point to the possibility of, over longer time periods, cyclic swings in the extent of centralisation of waste management responsibility. When waste management responsibilities and functions are distributed among local governments, unsatisfactory performance can easily be represented as problems of 'fragmentation' of responsibility. In addition, the local governments themselves may have difficulty in arriving at an institutional form with the requisite degree of centralisation of authority. For example, local government in Sydney in the 1960s had available to it the option of forming a county council to take responsibility for waste, as had been done earlier for electricity generation (section 4.5). However, because some local governments were well endowed with landfill capacity which they were understandably reluctant to share, progress towards a county council was painfully slow — so slow that local government's efforts were overtaken by the Coalition's need to move on environmental issues generally in the late 1960s, and on liquid waste disposal problems in particular in 1970. Consequently, the centralisation of authority was expressed through the other institutional form available at that time — the statutory authority established by State legislation. In general then, waste management authority distributed across local governments is likely to be prone to accusations of 'fragmentation'. Local governments may find difficulty in overcoming this due to the conflicts of interest among themselves, thereby providing a higher level of government with further justification for providing the centralised authority from among the institutional forms available to it.

However, one consequence of centralisation of waste management can be centralisation of the waste stream itself. For a single organisation with responsibility for waste transport and disposal, there are attractive economies of scale to be had. For example, it is cheaper to transport waste in large trucks or rail cars than in the smaller trucks used for household collection. Some of the costs of landfill establishment are independent of the size of the landfill, so that larger landfills enable the disposal cost per unit volume of waste to be reduced. Consequently, if cost of disposal is a matter of concern, centralisation of waste management with a single organisation is likely to lead to larger landfills. Proposals for such 'megatips' are more newsworthy and local opposition is stronger than for smaller landfills.

If, for the reasons described in section 12.5, above, establishment of landfills becomes politically difficult and a 'waste crisis' ensues, then devolution of responsibility to local government becomes an attractive option, not simply because it relieves the central government of the problem, but also because a number of smaller landfills may be easier to site than one large one. For the host community, the sense of inequity may be lessened if it is only receiving in its 'backyard' the wastes of the local community, rather than the wastes of the whole city. Once waste management responsibilities are distributed among local governments, then the stage is set once more for attributing shortcomings in waste management to 'fragmentation'.

While the time period of interest to this study terminated with the introduction of devolved waste planning in 1995, it can be noted that such arrangements for waste management do not guarantee freedom from siting conflicts. Ackerman (1997:61-62) describes how the requirement that subregions of Toronto be responsible for disposing of their waste within their own boundaries led to strong local opposition. The impasse was not resolved until waste could be transported out of the Toronto region. This suggests that, should Sydney's waste boards not have access to landfill capacity outside of their boundaries, the difficulties of the early 1990s waste crisis could re-occur.

Finally, it should be noted that, for this cyclicity in centralisation and distribution of waste management to occur, it is essential that there exist at least two levels of government and the institutional arrangements that make it possible for the upper level of government to take responsibility for waste disposal. This was the case in both Sydney and London, the latter city having experienced almost the same cycle from local government responsibility to a

central authority in charge of planning and disposal, and back to local government responsibility. However, the upper level of government involved in the cyclicity in the two cities was different — the NSW State Government in one case and the Greater London Council in the other.

12.6.3 Ecological Modernisation

As described in section 2.6.2, the term ecological modernisation refers to a late 20th century change in the nature of environmental policy and policy discourse — towards anticipatory measures that are profitable for industry; towards consultative relationships between industry, government and environmental interests; towards valuation of nature as a scarce resource rather than a free good and an orientation that sees science and capitalism essential to the solution of environmental problems, rather than being the cause of these problems (Hajer,1995:26-30; Dryzek, 1997:137-152). Gunningham, Grabosky and Sinclair (1998:8) characterise this change in the nature of environmental policy as a transition from 'first phase' environmental policy making (command and control regulation) to 'second phase' policy making (a retreat from regulation in favour of market-based policy instruments) to 'third phase' policy making which is held to be the 'smart' combination of the two previous phases.

Waste management policy discourse, and some aspects of waste management practice, in the late 1980s and early 1990s in Sydney undoubtedly bore many of the hallmarks of ecological modernisation. Waste management in Sydney became more anticipatory, insofar as waste avoidance, reduction and minimisation were explicit and widely discussed policy goals, expressed in simplified form in the various forms of the waste management hierarchy diagram. Whether the practice of waste management became more anticipatory is open to question. The professionals in the Metropolitan Waste Disposal Authority were working with a 30 year planning horizon in the early 1970s (appendix B5.2.1:2) and the Authority announced in the late 1970s that industry would be expected to reduce the amount of waste it produced (appendix B5.5.1:5). The Industrial Waste Exchange, which allowed industries to save disposal and input costs by exchanging waste materials, was also established about this time (section 5.6.3). On the other hand, during the waste crisis of the early 1990s, and with the removal of the waste planning function of the Waste Management Authority when it became the Waste Service, there appears to have been little attention paid to waste disposal beyond the immediate future

when it was thought that landfill capacity would be exhausted. In all, the Sydney experience would suggest that the anticipatory character claimed for ecological modernist policy making may apply more to policy discourse than policy practice. This may particularly be the case at times of political crisis and policy paralysis, when it is important for the legitimacy of politics that problems be discussed in the framings of ecological modernisation so that the irreconcilable conflicts of interest that cause the paralysis remain out of sight. As described in section 5.2.3, a fair proportion of the blame for the 1990s waste crisis could be laid at the feet of industry, the waste generation rate of which increased much faster than that of municipal waste in the 1980s. To this extent, the ecological modernist discourse of the crisis period was necessary to keep out of sight the uncomfortable fact that industry waste generation was tightly linked to economic growth. Not only this, the 'per capita slide' described in section 11.2.2 actually shifted industry's contribution to the oversupply of waste onto the householder.

With regard to the trend to consultative relationships, there was clearly a significant change in Sydney in the period 1970 to 1995. As described in section 5.10, the Metropolitan Waste Disposal Authority transformed its public relations activities from simple one-way information transfer to sophisticated strategies that allowed public input into some of its most professionalised functions. However, this is not to say that public input was unheard of in waste management prior to the late 20th century. As described in section 7.1.2, deputations to ministers of citizens concerned about beach pollution by rubbish occurred in the 1930s. There also existed at this time institutional arrangements that allowed the concerns of the public to be considered in public inquiries such as the one set up to examine the siting of an incinerator in 1934 (appendix B8.2.3:3). This type of ad hoc inquiry marks an intermediate stage in the institutions of environmental control between sole reliance on common law and the introduction of state legislation — a stage not recognised in Lake's (1994:237) characterisation of the rise of centralised environmental policy making.

With regard to the trend to value nature as a scarce resource, this was also clearly demonstrated in Sydney in the early 1990s. While the concept of landfill capacity, i.e. the unused volume remaining in existing landfills, had been developed in the early 1970s by the Authority's waste planning professionals, neither this capacity, nor land for future landfills, were referred to as resources until the early 1990s. At this time, this terminology became commonplace in

policy discourse as the neo-liberal economic rationalist analysis of the Greiner Government's 'new environmentalism' transformed public goods such as landfill capacity into scarce resources for allocation by the market; and waste disposal into consumption of waste facilities (section 6.12; appendices B6.7.1:2, B6.12.1:1).

Hajer (1995:33) suggests that there were affinities between ecological modernisation and the environmental policy ideas put forward by various neo-liberal think-tanks in the 1980s. As mentioned in appendix B6.1.3:27, and in section 5.9, the neo-liberal 'new environmentalism' of the Coalition Greiner Government brought pressure for increased privatisation and competition in the waste management in Sydney. While the idea of 'win-win' solutions that simultaneously met the needs of government, industry and the environment was very much part of Greiner's 'new environmentalism', the Greiner and Fahey Governments preference for privatising putrescible waste disposal found little public support and contributed to the Coalition's loss to Labor in 1995. Labor's Waste Minimisation and Management Act of 1995 ensured that putrescible waste disposal remained the responsibility of a statutory authority.

The transfer of waste management functions from the public to the private sector has been termed 'demunicipalisation' by Gandy (1993) (see appendix B2.4.2), and it could be argued that demunicipalisation is one of the manifestations of ecological modernisation in the waste management sector (see, for example, Hajer, 1995:32). Demunicipalisation as experienced in Sydney has some similarities to, and differences from, that which occurred in London and Hamburg according to Gandy's account. In Sydney, there was growing involvement of the private sector in the collection of waste (under contract to local government) and in the operation of non-putrescible waste landfills. However, the operation of putrescible waste landfills and large scale waste planning remained in the public sector (although such waste planning all but disappeared in the period between the replacement of the Waste Management Authority with the Waste Service and the formation of regional waste boards under the Waste Minimisation and Management Act of 1995). In the debates about allowing the private sector to operate putrescible waste landfills, there was never a plausible case put forward by the Coalition Government as to how waste reduction goals could be achieved when the private sector had every interest in filling landfills as quickly as possible to maximise their cash flow. In this respect, the ecological modernist ideal that

environmentally desirable solutions can be profitable for industry may not be achievable when it comes to waste disposal.

The final aspect of ecological modernisation to be considered in this section concerns the techno-optimistic aspects, such as put forward by Huber (1991), and Spaargaren and Mol (1992) - see the section on ecological modernisation in section 2.6.2. The experience with waste management in Sydney would suggest that some care has to be taken with any claims that the application of science and technology to developing anticipatory and preventative measures will lead industrialised societies out of the environmental problems of the late 20th century. In the first instance, it can be noted that the Metropolitan Waste Disposal Authority made significant advances in the technology of landfill operation and liquid waste treatment that avoided the worst of the environmental impacts of landfills and liquid waste disposal that had occurred in the 1960s and earlier. Insofar as these technological advances were made in anticipation of the known impacts of waste disposal, they were preventative measures that ameliorated the perceived environmental problems of the time, as the optimistic face of ecological modernisation would suggest. But viewed more broadly, these technological advances were still end-of-pipe solutions of the sort the ecological modernisation is supposed to supersede — these advances did not have any impact on the increasing production of waste by households and industry.

From the 1980s onwards, the Authority, Labor and Coalition Governments attempted to develop policy principles and measures that were more anticipatory in the broader sense mentioned above. While simplified policy principles such as recycling as the solution to waste problems, the waste management hierarchy, and various principles about the environmental friendliness of packaging types could be seen as the outcome of at least some scientific or ecological analysis of the waste disposal problem, such analysis was also capable of destroying political commitment to these policy principles by casting doubt on their environmental efficacy, as described in sections 12.4.4 and 12.4.5, above. The important point here, which appears to be overlooked in techno-optimist accounts of ecological modernisation, is that scientific rationality, while necessary for the development of new anticipatory solutions to environmental problems, is also capable of undermining the political momentum, built around simplified policy principles, that is necessary for the eventual implementation of the anticipatory solutions.

12.6.4 The Risk Society

The concept of ecological modernisation, viz. the application of science to developing anticipatory and preventative solutions to the environmental problems caused by science and technology, bears some resemblance to Beck's (1992(a):155-158) concept of reflexive modernisation, which refers to the application of the methods of science to the critique of science and technology itself, particularly the production of risks. Both ecological modernisation and reflexive modernisation deal with the role of science in modern environmental problems — but the former confines itself uncritically to the positive outcomes while the latter is more concerned with the legitimacy of science and the politics of risk.

The 20th century history of waste management in Sydney provides support for some aspects of the theory of the risk society, and suggests possible refinements to other aspects. With regard to the former, there were undoubtedly new sources of risks to health and environment associated with waste disposal that became evident in the 1980s, such as dioxin in landfills (section 8.6). Public perceptions of landfills have come to include more dangers than just the bad smells, vermin and disease that were the main concerns in the first half of the 20th century. As section 8.8 shows, fears about landfills can include exposure to toxic chemicals, danger of needle-stick injuries and AIDS, plastics and 'mutant' substances. Consistent with Beck's views, many of these modern risks are more a consequence of industrial production than an undersupply of hygienic technology (the health impacts of landfills were much reduced with the introduction of controlled tipping in the 1930s). However, Beck's claim that modern risks are global (affecting all individuals), while the risks of earlier times were personal (affecting just some individuals) may need more careful consideration. As described in section 12.2.2, above, there have been for some hundreds of years fears about agents of danger to which all individuals are exposed. In this sense, the miasmas of the 19th century were just as global as the risks of the late 20th century, although imagined rather than real. As argued in sections 2.2.3, 2.6.3 and 12.2.3, the important hallmark of modern risks may not be so much the universal exposure of the population to them, but rather the fact that the fundamental ecosystem processes that support life on the planet are transmitting risks from their point of production to their point of endangerment of the individual. Whereas this endangerment could be reduced in the past by remedial measures on minor components of ecosystems (for

example, controlled tipping that buried each day's food wastes to remove food and breeding habitat from rats and flies), the solutions to modern risks may involve major interventions in basic global life support systems (for example, a recent proposal to sequester carbon dioxide by fertilising the surface of whole oceans to promote plankton growth). In other words, it is the ecological seriousness of risks, rather than universal exposure of the population to them, that is the hallmark of the risk society.

What Beck (1992(a):29) terms the 'momentous consequence' of modern risks, viz. the loss of science's monopoly on rationality, was well demonstrated by the handling of the Castlereagh Depot. As described in section 5.5.2, Coalition ministers in the early 1990s continued to cling to the belief that scientific investigation could quell the fears of the people living in the vicinity of the Depot. This belief was ill-founded for two reasons. Firstly, consistent with Beck's view, the fact that the Government and its scientific advisers had allowed dangerous chemicals to be produced in large quantities and carelessly stored or disposed of, compromised the public's faith in any reassurances from scientific investigations of ground and surface waters around the Castlereagh Depot. Secondly, and this is an aspect that Beck appears to have neglected, it was mathematically impossible for an investigation of brain cancer clusters in the vicinity of the Depot to attribute the cancers to the presence of the Depot, or to rule out this possibility (what might be termed the 'iron law of statistical significance and sample sizes'). With the failure of science to resolve the issue, the incoming Labor Government closed the Depot on the grounds of the simple folk wisdom that it was better to be safe than sorry. As Beck (1992(b)) argued, the point is reached when the reassurances of the safety bureaucracy no longer carry any weight in policy debate. This was also seen with the British Government's slaughter of cattle during the mad cow disease scare, not on scientific grounds, but in an attempt to restore public confidence in British beef (Woollacott, 1998:47). The impossibility of science providing the assurances required by the political system and the public further strengthens Beck's claim as to the end of science's monopoly on rationality. Not only is science discredited for its past mistakes and for the value judgements embedded in its methods, as Beck describes at length, but science is incapable (mathematically for all time, not just temporarily due to lack of knowledge or tools) of answering some questions that are significant in politics and policy making. As Majone (1989:3), following Weinberg (1972), has argued, some of the questions that are of significance to politics and policy making are trans-scientific, i.e. while the questions can be stated in the language of science, the answers are

beyond the reach of investigation by scientific methods. Majone gives the example of the determination at the 95 per cent confidence level of whether X-ray radiation of 150 millirems increases the spontaneous mutation rate in mice by 0.5 per cent. Such a determination would require an experiment involving eight billion mice!

The Castlereagh Depot experience suggests further modifications to some of Beck's characterisations of the risk society may be needed. Beck frequently refers to the invisibility of modern risks and the dependence on science rather than the senses in making risks comprehensible, although admitting (1992(a):53) that personal experiences can make also risks visible. During the period that the Castlereagh Depot was attracting media and political attention, it was obvious occurrences such as birth deformities, illnesses and deaths among livestock that were the manifestations of danger which elevated the Depot to a political issue. While the community tended to attribute these occurrences to the invisible transport of chemicals in surface and groundwater, the scientific studies did not bring any new terminology or concepts to the public debate, as has been the case with other modern risks such as the greenhouse effect, ozone depletion or nuclear radiation. In other words, science was not necessary to make the risks visible at Castlereagh. Given the point made above that there have always been fears about invisible agents of danger, such as miasmas, and that the politics played out over the Depot's fate appears to be a good example of Beckian risk politics, it would seem that Beck's visibility-invisibility distinction between earlier and modern risks is not needed in explaining all forms of risk politics.

Viewing the history of waste management in Sydney more broadly, there is also clear support for one of the more important theses of risk society theory. Beck argues that, with the fall from favour of the policy approaches of the welfare state, and with the acceleration of industrial progress and the production of risks, there is an increasing tendency for decisions that affect the structure of society and the welfare of the populace to occur within the private sphere of business and industry, rather than within the public sphere of the legislatures and public policy making that is, at least in theory, accessible to the wishes of the populace through the institutions of democracy. It is such decision making within the private sphere that Beck terms 'subpolitics'. Perhaps the starkest example of waste subpolitics in Sydney was ICI's decision to stockpile hexachlorobenzene at its factory at Botany Bay. Whether or not Sydney's citizens should have to live with 8000 tonnes of a dangerous chemical in their

midst is clearly a matter for public policy, yet the decision (and subsequent non-decisions to develop safer methods of disposal) remained out of sight in the private sphere until initiatives by the Federal Government and associated stocktaking activities brought the hexachlorobenzene to public notice. As Beck (1992(a):186) notes, once risk production in the private sphere is the centre of political attention, industry finds that formerly internal decisions become politicised and public. Certainly, ICI and other chemical companies have experienced considerable intrusion by the requirements of legislation introduced in the 1980s and 1990s. However, Beck appears not to appreciate that such intrusion can be welcomed by industry. In the case of ICI, by allowing hexachorobenzene to accumulate to the point that it became a public policy issue, a substantial part of the costs of discovering a solution were then borne by the Federal and New South Wales Governments. A further example of industry welcoming environmental policy initiatives was described in section 4.8.1 in relation to the interests of industry in the centralisation of waste management authority in the late 1960s. More generally, a number of circumstances can be suggested in which industry will welcome the imposition of environmental standards.

Firstly, if green issues are irrelevant for the purchasers of a firm's products, then there is no point in the firm competing on the level of pollution control involved in production of the goods. Consequently, firms may prefer uniform standards simply to preserve the reputation of the industry as a whole, provided compliance is not too costly (Rees, 1994, cited by Gunningham, Grabosky and Sinclair, 1998 used the term 'community of shared fate' to describe this situation). Secondly, if there are economies of scale in effluent treatment, then larger firms may welcome uniform standards as a way of disadvantaging their smaller competitors, or as a means of raising barriers to entry in the industry (see, for example, Cohen, 1998:5). Thirdly, if there are those among consumers who are sensitive to green issues, and some firms are competing successfully for this segment of the market, but with misleading claims about the environmental friendliness of their product, then other firms which have a real competitive advantage in terms of the actual environmental friendliness of their product may welcome the imposition of uniform standards that would disadvantage those firms making misleading claims. Fourthly, if firms believe they are exposed to the risk of common law litigation by those affected by their pollution, they will welcome the imposition of government standards, as then they only have to comply to these standards to absolve themselves of responsibility for the impacts of their pollution. In addition, legal

defence under statute law will generally be less complex and expensive than under common law.

A less stark example of subpolitics at work in the waste stream, but perhaps one that is more significant for the understanding the long term evolution of waste management policy, is the myriad of decisions made within the private sphere that result in the growth of the volume of the waste stream. The volume of the waste stream has important public policy implications, as the waste crisis of the early 1990s showed. Yet it is commercial decisions, such as replacing reusable glass milk bottles with cardboard and plastic containers, to name just one of the thousands of decisions made in the packaging industry alone, that affect the volume of the waste stream. The invisible subpolitics of waste creation creates major uncertainties and difficulties for the visible public politics of waste disposal, as the Metropolitan Waste Disposal Authority found, for example, when the introduction of wheeled garbage containers by private contractors rapidly increased the volume of garden waste in the waste stream (appendix B5.2.2:12). It is such difficulties at the disposal end of the waste stream that make anticipatory and preventative policy approaches applied further upstream an appealing proposition although, notwithstanding the circumstances mentioned in the previous paragraph, some such measures may meet with industry resistance, such as the actions of the packaging industry mentioned in section 12.4.4, above.

The final aspect of risk society theory that the present study suggests could be more fully developed relates to the means by which public perception of risks may or may not come to political attention. Beck is somewhat brief in this area, referring to risks developing 'an incredible political dynamic'(1992(a):77), but providing little detail as to exactly how this happens. In particular, Beck appears not to give any explanation as to why risks may be ignored for long periods, only to become the centre of political attention at other times. For waste, the social constructivist concepts of waste as matter out of place and as deviant matter subject to a form of moral panic as described in sections 12.2.4 and 12.2.5 above offer a more developed explanation. Of course, such an explanation may not apply to other types of modern risks, such as nuclear war or climate change. Explanation for these risks may have to draw, for example, on the risk perception work of Slovic and others (see, for example, Slovic, 1987; Slovic, 1993 and Slovic and Peters, 1998).

12.7 Waste Management Histories

There are a number of similarities between waste management in Sydney and in the large cities of the USA as described by Melosi (1980). The replacement of the miasmic theory of disease by the germ theory, the sanitary movements of the late 19th and early 20th century and the professionalisation of waste management in the early 20th century occurred in Sydney in much the same way as in large cities in the USA. Incineration became a popular means of waste disposal in Sydney in the 1930s, as in the USA , not the least because USA incinerator firms marketed their products aggressively in Sydney. However, the upsurge of incineration (waste-to-energy) plants in the 1980s in the USA was not mirrored in Sydney, despite the efforts of US firms to sell incinerators in Sydney. In the early 1980s, the Metropolitan Waste Disposal Authority was achieving economies of scale and improvements in leachate control that would have made incineration an unattractive proposition. By the late 1980s, the mobilisation of public concern over high temperature incineration had made incinerators politically unattractive. Thus while there was a form of 'globalisation' even in the 1930s by which the actions of private companies resulted in similar approaches to waste management in the USA and Sydney, the experience in the 1980s showed that local conditions could easily over-ride these global commercial forces. Finally, it should be noted that this study is in agreement with Melosi's finding for the USA that there is no relation between the quantitative data for waste quantities and landfill capacity and the occurrence of waste or garbage crises, thereby supporting the view that such crises are socially constructed and need to be studied from a constructionist perspective.

In relation to Gandy's case studies of New York, London and Hamburg, the present study supports Gandy's view that waste management has gone through a period of municipalisation during much of the 20th century, followed by a period of demunicipalisation in the last 20 or so years of the century. However, the extent of demunicipalisation of waste management in Sydney appears not to have been as great as it was in the cities Gandy studied, due largely to the replacement of a conservative government which favoured neo-liberal approaches to waste management by a Labor government which was prepared to support the popular view that putrescible waste management should remain in public hands. Once again, this demonstrates the potential for local politics to cause departures from broad trends that are discernible across a number of countries. While financial constraints affected local government in

Sydney in much the same way as in the United Kingdom or the United States, leading to the contracting out of household waste collection, the contribution of these constraints to the demunicipalisation of waste management in Sydney may have been less, due to the commitment of the Labor government to keep putrescible waste management in public hands. This commitment may have also limited the opportunities for expansion of the growing international corporate presence in waste management. There have been, however, changes to this situation in the period subsequent to that set for the study (see section 13.4), with the result that further demunicipalisation and penetration of waste management by international corporations is taking place.

Gandy's conclusion that higher levels of recycling are more likely to occur where a central authority has responsibility for planning, collection and disposal is not well supported by the findings of the present study, insofar as Sydney had a higher recycling rate than Hamburg in the late 1980s, despite the former's distribution of responsibility between the MWDA and local government. Although there were problems in the MWDA obtaining the cooperation of local government to trial kerbside collection, the recycling rate was considerably higher than that in London in the same period, due perhaps to the efforts of packaging interests. The introduction of kerbside collection, however, was more a consequence of innovative local governments responding to ratepayer concerns than, as Gandy found, of involvement by packaging interests seeking to avoid interventionist packaging legislation. Nevertheless, at the national level in Australia, packaging interests, along with representatives of local government, are now very much involved in the development of national arrangements for funding kerbside collection of recyclables.

Colten's (1994) study of chemical waste disposal in the USA from 1900-1960 revealed a number of strategies employed by the industry to deflect public intervention in its production and disposal of wastes, either through litigation or public policy. The present study has found, as Colten did, that site isolation, discharge to sewers and re-sale of disposal sites were strategies pursued by industry to avoid the costs of effluent treatment. However, the experience with hazardous and liquid industrial wastes suggests two other strategies that industry can use to transfer future risks and the costs of discovering disposal solutions to the public sector. One is to encourage governments to establish a central disposal facility under government control, such as the Castlereagh Depot — the other is to store waste until sufficient quantities accumulate to

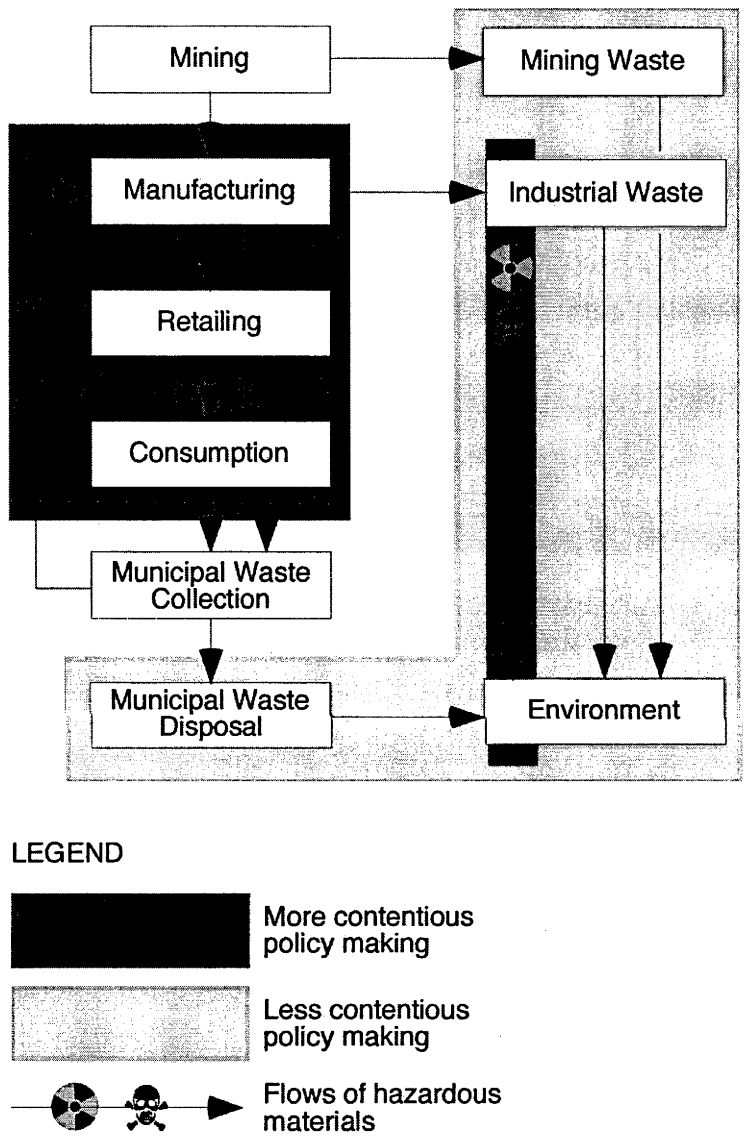
pose a serious concern. In both cases, the effect is to transform a private disposal problem into a public policy issue. While both the Castlereagh Depot and hazardous waste disposal involved charges to industry, it is unlikely that these ever covered the enormous costs of public discovery of solutions, such as the two high temperature incinerator inquiries and the extensive research by the Metropolitan Waste Disposal Authority into liquid waste treatment and the environmental management of the Castlereagh Depot. Indeed, if governments were to charge the full cost of industrial waste disposal via its facilities, much waste would simply be dumped illegally, either in bushland or hidden in loads of solid waste to landfill, as is borne out by the relatively high rates of such dumping that have occurred in Sydney, even with disposal costs set well below the level of full cost recovery. It is this impossibility of completely preventing illegal industrial waste dumping that ensures that solid waste issues will remain linked to hazardous waste issues in the politics of waste management. Luton's (1996) study of waste management in Spokane in the 1980s and 1990s also revealed the structural impotence of public policy that is located at the receiving end of the materials and waste stream (figure 12.2). In this case, local government was unable to avoid bearing most of the financial risks from the operation by the private sector of a large scale municipal incinerator, given the uncertainties in waste volumes and composition.

12.8 Policy and the Materials Stream

Lastly, it remains to return to the concept of the materials flow introduced in chapter 1 and suggest that the fundamental nature of the materials stream has a role in determining the incidence of the types of waste policy debates that resist ready resolution. Central to this is the argument put forward by Wynne (1992), that anticipatory and preventative policy that has a locus of application further upstream in the materials flow will have a greater degree of uncertainty about the ultimate environmental outcomes. According to Wynne, the most extreme form of uncertainty is indeterminacy, which applies to policy intervention at the upstream end of the materials flow, from where it is theoretically impossible to determine the outcomes. This view is consistent with the description of the shortcomings of life cycle analysis and principles that suggest preferred types of packaging (sections 12.4.4 and 12.4.5, above). Both of these involve a locus of application of policy at the upstream end of the materials flow (in the 'Manufacturing' box in figure 12.2, below) to achieve outcomes in

the 'Environment' box via the 'Retailing', 'Consumption', 'Municipal Waste Collection' and 'Municipal Waste Disposal' boxes.

Figure 12.2: Waste policy and the materials stream



Compared to the indeterminacies of the path to the environment via the 'Retailing', 'Consumption', 'Municipal Waste Collection' and 'Municipal Waste Disposal' boxes, the path to the environment from 'Mining' and 'Manufacturing' via 'Mining Waste' and 'Industrial Waste' has considerably fewer intervening social and economic influences that might render environmental outcomes difficult to predict.

It is suggested that uncontentious waste policy making tends to be found on the right side of the figure 12.2, *viz.* control of pollution by mining and manufacturing industries, and at the bottom, *viz.* the control of impacts of municipal waste disposal, such as leachate pollution. The exception is hazardous waste policy, where uncertainty and indeterminacy derive from environmental and biological factors, rather than from the sorts of social and economic factors that affect materials flow through 'Retailing' and 'Consumption'. Contested and drawn out waste policy debates are also more likely to be found in attempted anticipatory policy interventions in the upper part of the materials flow through the 'Consumption' box. The history of waste management in Sydney since the 1960s reflects this difference — the main thrust of the 1970 Waste Disposal Act was to control the disposal of relatively benign liquid industrial wastes while the quantities of municipal solid waste were not an issue. On the other hand, anticipatory policy that attempted to reduce the waste quantities generated by the 'Retailing', 'Consumption' route was an important issue in the 1990s waste crisis.

It is the waste policy domains marked in dark grey in figure 12.2 , i.e. anticipatory municipal solid waste management policy and hazardous industrial waste policy which will remain fertile grounds for constructionist approaches to understanding the evolution of waste management policy. These are also the domains where Beckian risk politics will be played out and the ecological modernist transition to anticipatory policy will continue to fall short of the theoretical ideal.

13. CONCLUSIONS

13.1 Introduction

The previous chapter has discussed and drawn a number of conclusions from the detailed findings of the study that followed from the research questions that were set for the study in chapters 1 and 2 . This chapter provides an overview of these conclusions.

13.2 Influences on the Evolution of Waste Policy

13.2.1 The Social Construction of Waste and Waste Places

The study shows that that solid waste management policy is influenced by the social construction of meaning in relation to waste substances and places in the environment where waste is deposited intentionally or unintentionally. This occurs through the elevation of particular aspects of waste or waste management to become matters of public concern and policy debate. It is argued that this has some of the features of moral panics, particularly with respect to the role of the media in the early stages of emerging waste policy debates in creating the inventory of symbols and meanings which provide the frames for subsequent reporting and political debate (section 12.2).

However, the study shows that it is important to consider the meanings for people of both waste and the place where it accumulates. Juxtapositions of waste and places of accumulation may be largely invisible to public notice for long periods of time. However, at particular times, these juxtapositions begin to attract public concern and policy debate for two reasons: either there is a change in the way in which the place of accumulation is understood or used, or

there is a change in the way in which the waste material itself is understood (section 12.2.3).

Not only is the meaning attributed to waste and waste places significant in the emergence of public concern, but also people's awareness of the agents of danger that can convey dangers to a person's cleanliness or health from distant accumulations of waste. It is argued that these are a persistent feature of public concern about waste accumulations and the emergence of new agents of danger is a further way by which accumulations of waste may come to excite public concern and policy debate (section 12.2.4).

This analysis of how the way in which wastes and waste places are understood affects waste policy is a first step towards a more formal social constructionist theory of the evolution of waste policy making, an area which has received very little attention to date.

13.2.2 The Role of Discursive Devices in Policy Debate

The construction of waste management issues and policy options by policy actors has also received very little attention, although other environmental issues have been the subject of a small number of studies. The findings lend strong support for constructionist theories of policy formation which emphasise the importance of discursive devices such as binary codes or dualisms, generative metaphors and story-lines that make discursive closure and policy progress in particular directions possible, while closing off other directions. However, this study is the first, as far as I am aware, that has shown how, under conditions of vigorous debate and politicisation, discursive devices such as simplified policy principles can only facilitate policy progress if the protagonists in the debate refrain from scientific scrutiny that raises uncertainty about these principals and destroys their political legitimacy (section 12.3).

13.2.3 Other Factors Influencing Policy

While it is argued that the sorts of constructionist analysis summarised above can make a significant contribution to understanding the evolution of waste management policy, considerable effort has also been devoted to a realist analysis to understand the many structural factors that also influence the evolution of waste policy. The study has shown that a number of the influences

on environmental policy making that have been described in the literature also apply to waste management policy. These include electoral factors (section 12.4.1), the constraints of political ideology (12.4.2), factors associated with the state agencies charged with implementing policy (12.4.3), environmental movements (12.4.6) and individual policy actors (12.4.7).

13.2.4 Longer Term Trends in Policy

The study suggests that it is unwise to attempt to claim an explanatory monopoly for the effect of either structural or discursive factors on environmental policy making. Viewed over the longer time period available to this study, it would appear that structural and discursive factors are inter-related, in that structural factors may determine the amount of discursive effort that the political system has to put into obtaining problem closure. If structural factors mean that the policy issue is a tractable one, then discursive closure may occur fairly rapidly around a single framing of the problem. When structural factors severely restrict the range of possible policy solutions, it is then that discursive elements such as dualisms and simplified policy principles may appear in abundance in policy discourse as policy actors attempt to find framings that will make the problem fit the available solutions. The inter-relationship between structural and discursive factors also works in the opposite direction. If a particular discursive element allows problem closure and is reflected in institutional innovations, then these new institutions may furnish the structural constraints on future policy discourse.

The relatively long time period of the study has also made it possible to propose a novel theory of cyclic change between centralised and regionalised responsibility for waste management, a theory that is not only supported by the evolution of policy in Sydney, but also by that in London.

The study has also provided some useful insights relevant to two theories of long term change in environmental policy — ecological modernisation and the risk society.

With regard to ecological modernisation, the findings show that, consistent with other areas of environmental policy making, ecological modernisation has made an impression both on the language and the rationale expressed in waste policy discourse, and on the degree of public consultation during the resolution

of waste management issues (section 12.6.3). However, the optimistic claim that the ecological modernist approach to policy will mean an end to environmental problems is not supported. While anticipatory approaches have made some impression on the less complex problems, such as non-hazardous liquid industrial wastes, it is the problems, such as the increasing volume of the waste stream, that originate in the structural dependence of society and the economy on materials consumption, where the promise of ecological modernisation fails to be realised. This is due in large measure to both the type of indeterminacy discussed in section 12.7 and the ability of industry to protect its interests by wielding scientific analysis to undermine any politically appealing anticipatory principles that would intervene in its decision making (section 12.4.4). Science enables successful anticipatory solutions to be devised when problems are tractable, but it can also destroy the political support and momentum for overly simplistic solutions to intractable problems, thereby preventing the organisational learning that might have occurred if the solutions were implemented and brought either success or failure.

In respect of risk society theory, the 20th century history of waste management in Sydney provides some support for Beck's enunciation of the theory, but also suggests there are a number of aspects where it unduly simplifies the nature of modern risks and their role in policy evolution (section 12.6.4). The sorts of risks that lie behind public fears of landfills have certainly come, in the late 20th century, to include a substantial component of industrially produced risks. However, the thesis argues that the history of waste management shows that neither the global nature of risks, nor their invisibility, is necessarily a hallmark of modern industrial production of risk as Beck maintains. The decline of the monopoly of scientific rationality in the risk society is borne out by the events around the closure of the Castlereagh Depot, but there is a need to acknowledge that this is not only due to loss of public faith in science, but the trans-scientific nature of some policy issues. Lastly, the argument in the thesis that public concerns about waste can be brought to political attention in a similar fashion to that which occurs in moral panics, fills out an area of the theory of the risk society where Beck provides very little detail.

13.3 Concluding Comments

The Sydney case study has largely supported the findings of similar studies of USA cities in general, and of New York, Hamburg, London and Spokane in

particular. Where the studies have been largely atheoretical, any differences between such studies and the Sydney case study do not appear to significantly compromise the generalisations that have been put forward in this and the previous chapter. Taking the Sydney case study together with other studies which have brought various theoretical perspectives to bear on the task of explaining waste management policy making, such as the work of Gandy and Luton, it would have to be said that realist explanations appear to have wide application across a number of cities. However, it is hoped that this study has demonstrated the explanatory utility, both of constructionist approaches in their own right, and of bringing together constructionist and realist approaches.

The Sydney case study has also demonstrated that the study of waste management policy can make a significant contribution to the understanding of trends in environmental policy making and the factors that are involved. However, the special qualities of waste with respect to the social construction of meaning would suggest that waste management will remain an important topic for constructionist study, and the theories of environmental policy making are unlikely to explain all aspects of waste policy making.

13.4 Postscript

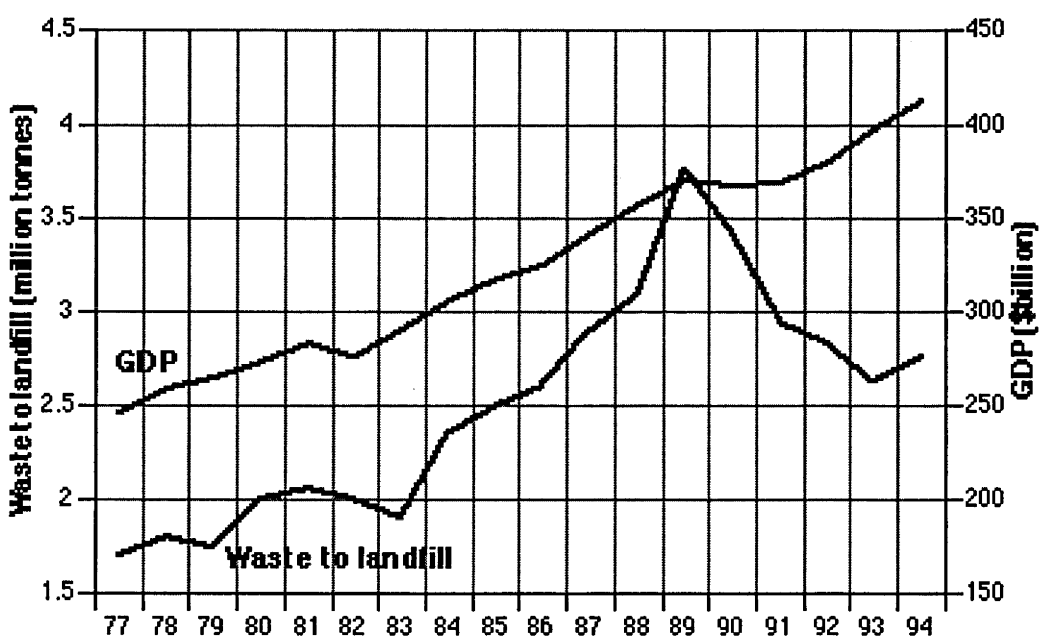
Just over nine years have passed since the passage of the 1995 Waste Minimisation and Management Act — the event that was chosen as the end of the period with which this study would be concerned. However, the one question about this period that is likely to be of most interest to the reader is whether or not the target of a 60 per cent reduction in the per capita amount of waste going to landfill by 2000 was achieved. It will be recalled that this target was a major aim of the 1995 Waste Minimisation and Management Act, not to mention an important discursive element around which the policy discourse of the 1990s waste crisis was structured.

The report of the State Government's Inquiry into Alternative Waste Management Technologies and Practices published in April 2000 found that the amount of waste to landfill in 1998 was about the same as in 1990, the base year for the 60 per cent target. Approximately 4.0 million tonnes were disposed of annually, with 2.5 million tonnes of waste diverted to recycling. Given the relatively low rates of recycling in 1990, this would suggest that the overall generation of waste has increased during the 1990s. The reduction in per capita

terms in waste going to landfill between 1990 and 1998 was reported by the Inquiry to be 18 per cent. This would suggest that it is extremely unlikely that the 60 per cent target was achieved by 2000.

If the figure of 4.0 million tonnes in 1998 is compared with graph of figure 13.1, it would appear that the amount of waste to landfill has essentially returned to the relationship to GDP that existed prior to the mid-1980s.
In June 2001, the pendulum of waste management responsibility swung back towards centralisation with the introduction and passage of the Waste Avoidance and Resource Recovery Bill by the New South Wales Government. This Bill establishes a statutory authority, Resource NSW, to replace the regional waste boards that were formed under the 1995 Waste Minimisation and Management Act. Consistent with the view put in the thesis that the waste management hierarchy is a symbolic code around which political actors and interest groups position themselves, the hierarchy has undergone yet another transformation as part of the objectives of the 2001 Waste Avoidance and Resource Recovery Act.

Figure 13.1: Australian GDP and solid waste sent to landfill in Sydney for the period 1977 to 1994. GDP for Australia is a proxy variable for the level of economic activity in Sydney. (Sources: Australian Bureau of Statistics, 1997; Waste Management Authority, 1990(a) and data supplied by NSW Environmental Protection Authority Waste Branch).



Perhaps the most interesting development, from the historical perspective of this thesis, is the establishment of a large resource recovery plant, the Eastern Creek UR-3R facility in Sydney's west. This will ultimately take 16 per cent of Sydney's household waste and transform 80 per cent of that into energy and materials that can be used rather than being disposed of in landfill. This plant, operated by Global Renewables Ltd under contract to Waste Service NSW (the descendant of the Metropolitan Waste Disposal Authority), was established in 2004 with scarcely any of the political and public angst that surrounded the 'mega-landfills' of a decade previously. A study of the ten years of waste management policy from 1996 to 2005 would make a significant contribution to the further understanding of the evolution of waste management policy.

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